

**S F**

523

A19

LIBRARY OF CONGRESS.

*Chap.* SF 523

*Shelf* A 19

*Copyright No.*

UNITED STATES OF AMERICA.





















A NEW SYSTEM  
OF  
BEE-KEEPING;

*Adapted to the Habits and Characteristics of the*  
HONEY-BEE:

WITH DESCRIPTIONS OF, AND DIRECTIONS FOR  
*MANAGING BEES IN THE SECTION BEE-HIVE.*

EMBRACING ALSO

*Improved Methods of Artificial Swarming, whereby the business  
of Bee-Keeping is rendered more Profitable  
and Pleasant.*

By D. L. ADAIR,  
HAWESVILLE, KY.

---

CINCINNATI:  
ROBERT CLARKE & Co., PUBLISHERS, 65 WEST FOURTH ST.

1867.

SF522

.A19

---

*Entered, according to Act of Congress, in the year 1867,*

*By D. L. ADAIR,*

*In the Clerk's Office of the District Court for the Southern District of Ohio.*

---

220194x-

## P R E F A C E .

---

IT is not the intention of the author of this little book to discuss, minutely, the subject of Bees and Bee-Culture. That has been well done by Langstroth, Quinby and others, who have written extensively on the subject; but conceiving that he has made some advance in Bee-Keeping, particularly in the construction of Hives, and honey receptacles, and also in the methods of making artificial swarms, he has attempted in as short, plain and comprehensive a manner as possible, to lay before the public all, that he considers of any importance, that he has learned from a practical experience of twelve years.

When he first concluded to introduce the Section Bee-Hive, he set about writing out a few plain directions for using it, to be issued in a circular, but found that the new hive required a new system of bee management, which could not be given in a few pages, nor learned from the books heretofore issued. To bring it into successful use, it was necessary to state every fact, and every particular, that could be of service in working it to the best advantage. In this he could not be assisted by any precedent, the hive being original and novel, consequently he had to rely on his own experience almost entirely. If he has succeeded in making himself understood, it is all he desires, believing that the new system, when comprehended, will commend itself to public favor.

D. L. ADAIR.

*Hawesville, Ky, 1867.*





# INDEX.

	PAGE		PAGE
Advantages of Section Bee-Hive...	17	Drones Described.....	63
After-Swarms .....	9	Drones Mature in Twenty-four	
Age of Drones.....	7	Days.....	65
Age of Queen.....	7	Drumming.....	31
Age of Workers.....	7	Dzierzon's Theory.....	8
Air-Space .....	17	Educating Bees.....	69
Ants .....	72	Eggs.....	64
Artificial Swarming.....	29	Enemies of Bees.....	71
Advantages of.....	29	Entrance-Holes.....	14
Assisting a New Swarm.....	27	Equalizing Swarms.....	36
Bee-Bread.....	60	Experiments with Observing-Hive	65
Bee-Moth.....	71	Facts About Bees.....	7
Bees Learn Nothing.....	69	Fecundation of Queen.....	8
Birds Catch Bees.....	72	Fertile Workers.....	7, 53
Brood-Chambers.....	14	"Filly" Swarm.....	10
"Buckwheat" Swarms.....	10	Forced Swarming.....	31
But One Queen in a Hive.....	8	Guard-Bees.....	62
Care and Treatment of Bees.....	69	Guides.....	15
Case of Hive.....	16	Habits of Bees Not Changed.....	70
"Cast" Swarm.....	9	Handling Bees.....	67
Catch the Queen, How to.....	51	Hiving Natural Swarms.....	25
Cause of Robbing.....	72	Honey-Boxes .....	16
Cells of Three Kinds.....	8	Honey-Cells.....	62
Charming Bees.....	67	How Bees Work in Honey-Boxes	19
Chlorefforming Bees.....	68	How Bees Work in the Section	
Colonizing, First Method.....	48	Bee-Hive.....	19
Second Method.....	49	How Many Bees can be Kept in	
"Colt" Swarm.....	9	one place.....	56, 57
Comb, How Made.....	61	How to Catch the Queen.....	51
Comb, Save the Surplus.....	21	How to Get the Bees Out of Boxes.	21
Directions for Using Section Bee-		How to Handle Bees.....	67
Hive.....	19	How to Make Four Swarms from	
Disturbing Bees.....	69	One.....	43
Dividing.....	39	How to Make Swarms by Divid-	
Driving Bees.....	31	ing.....	39, 40, 42
Driving-Box .....	31	How to Remove Laying Workers	53
Drone-Comb.....	44	How to Tame Bees.....	67

	PAGE		PAGE
How to Take Off Honey-Boxes.....	21	Queen, Matures in Sixteen Days...	65
Inducing Bees to Work in Honey-		Queenless Hive.....	65
Boxes .....	20	Robber-Bees .....	72
Italianizing .....	52	Robbing, How Caused.....	72
Larvæ .....	64	Robbing, How to Remedy.....	73
Laying Workers.....	7, 53	Salt on Bottom-Board.....	19
Laying Workers, How to Remove	53	Save Surplus Comb.....	21
"Maiden" Swarm.....	10	Section Bee-Hive Described.....	14
Making a Queen.....	60	Sections Described.....	14
Mice in Hives.....	72	"Settling" Swarms.....	9
Moths.....	71	Snakes and Toads.....	72
Moth-Miller .....	65	Spiders Catch Bees.....	72
Moth-Proof Hives.....	71	Swarming .....	9
Non-Swarmer Hives.....	10	Swarming, Artificial.....	29
Nucleus Swarming.....	45	Swarming-Box.....	25
Number of Bees in a Swarm.....	10	Taming Bees.....	67
Nursing Bees .....	65	Taming Bees with Chloroform....	68
Observing Bee-Hive.....	59	Taming Bees with Puff-Balls.....	68
Office of the Drones.....	9, 65	Tame Bees with Smoke.....	67, 69
Office of the Queen.....	64	Three Kinds of Bees.....	60
Office of the Workers.....	9, 60, 62	Toads and Snakes.....	72
Overstocking .....	59	To Empty the Bees from Hive	
Passage-Holes .....	15	without Taking the Queen.....	54
Piping.....	10	To Prevent Swarming.....	23
Pollen .....	60	Transferring and Dividing.....	37
Preface.....	5	Transferring from old Hives.....	34
"Prime" Swarm .....	9	Ventilating Bees.....	63
Profits of Bee-Keeping.....	55	Wax, How to Make.....	61
Propolis.....	61	When to Divide.....	40, 42
Pupæ .....	65	When to Drive Bees....	31, 33, 40, 42
Queen, Age of.....	7	When to Make Artificial Swarms.	30
Queen-Cell, Described.....	62	Wintering Bees.....	23
Queen, Described.....	64	Workers Hatch the Young.....	62
Queen, Her Office.....	64	Workers, Mature in Twenty-One	
Queen, How to Catch.....	51	Days.....	65
Queen, Lays two Kinds of Eggs...	7	Workers, Office of.....	9, 60, 62

# NEW SYSTEM OF BEE-KEEPING.

---

## CHAPTER I.

### FACTS ABOUT BEES.

1. A COLONY OF BEES consists of three different kinds of individuals: The queen, workers, and (during part of the year) drones. The drones are the male bees. The queen is the only perfectly developed female in the hive. The workers are imperfectly developed females, and only in rare instances (if ever) lay eggs, which only hatch out drones.

2. The queen lives four or five years; but after she is three years old her vigor decreases, and she often, at four years old, becomes so infirm as to be incapable of laying eggs enough to populate the hive and keep it strong. Some of the most experienced bee-keepers recommend destroying her at three years old. If it were not for the difficulty of knowing how old each queen is, I have no doubt that it would be a good plan to do so. It is impracticable, as a general rule.

3. A worker lives from two to nine months.

4. A drone lives as long as the workers will let him.

5. The queen lays all the eggs found in the hive, where there is a queen present. Sometimes there is no perfect queen in a hive, and it is the general opinion of bee-keepers that a common worker is then set up as queen, which lays eggs, from which drones, and drones only, are hatched. Whether it be a common worker, with her organs of generation more highly developed than ordinary, or a queen whose organs are defective, can not be ascertained, or has not been. I am inclined to believe that it is the latter.

6. The queen lays but two kinds of eggs; male and female. From the former are hatched the drones; from the latter proceed the queens and the workers. If the eggs are laid in the smallest cells, which are about one-fifth of an inch in diameter, they are

female eggs, and hatch out workers; if laid in larger cells, which are about one-fourth of an inch wide, they are always male eggs, and develop drones: if laid in peculiarly formed, acorn-shaped, hanging vertically, "so-called," royal-cells, they are always female eggs, and from them the bees, by a peculiar nursing and feeding, rear queens. The queen has been known, so say good authorities, to lay three thousand eggs in a day. She has a sting, but only uses it in conflict with another queen.

7. The queen can lay male or drone eggs, without being fecundated by the drone, but in order to be able to lay female eggs, she must be fecundated. When once accomplished, it is efficacious during her life, or so long as she retains her health and vigor.

8. The fecundation of the queen is accomplished by a single drone, outside of the hive, and on the wing. This is the received theory, although we have good authority for saying that sometimes fertilization does take place without her going forth for the purpose, as, for instance, when confined with drones in a glass vessel.

9. If the queen be not fecundated, Dzierzon says, she ordinarily does not lay eggs. Still, he says, exceptional cases sometimes occur, and the eggs then laid produce drones only.

10. The bees tolerate but one queen in a hive at a time, except in rare instances, and for a short time. Sometimes a young queen is found in a hive just before the death of an old queen, and sometimes just before the issuing of a swarm with the old queen.

11. The foregoing ten sections contain, substantially, all the points of what is known as the "Dzierzon theory," at least, all that is important. This theory received its name from the Rev. Mr. Dzierzon, of Karlsmarkt, Silesia, to whom is now generally accorded the honor and credit of solving the mysteries, in which the history of the propagation of bees, together with their classification and characteristics, had been involved for centuries. Although, when first put forth, his theory was violently assailed by all the principal bee-keepers of Europe, an intelligent investigation of it, caused it to be generally recognized everywhere; and upon it is now based all the different successful systems of bee-keeping; and that system is found to be the most perfect, which accommodates itself most nearly to his theory. The bee-keeper, who expects success in the business, should thoroughly study and understand it. Without it he can hardly expect the skill and judgment necessary to great success.



12. The drones have no sting. Their only use seems to be the fertilization of the queen. Their number depends on the number of drone-cells in the hive. They are driven out or killed by the workers as soon as the honey-harvest and swarming is over.

13. The workers do all the work of the hive except laying eggs. They collect all the honey, bee-bread and propolis, make wax, build the combs, hatch and feed the young, raise queens, guard the hive, keep it clean, and in rare instances (perhaps?) lay eggs; from which drones only can be hatched.

14. The queen requires sixteen days, the workers twenty-one days, and the drones twenty-four days to mature, from the time the eggs are laid—a day or two, more or less, according to the strength of the colony, and weather.

15. Each populous colony in an ordinary sized hive, when honey is abundant, rears one or more young queens. When the first one is about to emerge from her cell, the old queen, with a portion of the workers and drones, leave the hive, which constitutes swarming. The first queen that emerges takes her place, and if the colony still be populous, and honey very abundant, she leads off a second swarm, when the second young queen is about to emerge; and sometimes even a third, fourth, and fifth swarm are thrown out from the same hive in this way.

16. There are very few swarms that fly off to the woods without first alighting on a bush, shrub, or tree, and all ringing of bells, blowing horns, beating pans, and other noises are useless in "settling" them, as it is called. All swarms that will cluster at all, will do so without any of the hurrah that is generally made. If it has any effect at all, it is rather calculated to drive them off.

17. The first swarm that leaves the hive in the spring, is called the "*prime*" swarm, and is usually the largest; but as it is the old queen that leads them, may not be the best or most valuable; all swarms issuing thereafter, the same year, are called "after-swarms."

18. The second swarm, or first after-swarm is called a "*cast*," and may be expected within fourteen days after the "*prime*"—usually about the tenth or twelfth day. It is nearly always weaker than the "*prime*," but as it has a young, vigorous queen, makes the most valuable of stocks, if they pass the winter safely.

19. The third swarm, from the same stock, is called a "*colt*," and is also valuable if it can be wintered. A fourth swarm is called a

"*filly*." These follow the second, or "cast," at intervals of one to three days. In favorable localities, and by proper management, I have known valuable stocks made from them.

20. A swarm from a swarm is called a "*maiden*" swarm, and is led by the same queen that accompanied the "prime." This is usually a strong swarm, and with a little assistance is as valuable as a "prime" swarm.

21. A swarm coming after the general swarming season, in August, or later, is called a "*buck-wheat*" swarm, and is generally very weak in numbers. I have made strong stocks from them, but except in very favorable seasons and localities, they had better be returned to the parent hive, after destroying the queen, or be added to some weak colony, to strengthen it.

22. There are no eggs laid in the old stock, after the first swarm leaves, until the young queen emerges and becomes fertilized—generally two weeks—sometimes three.

23. For twenty-four hours, or more, previous to a swarm leaving, "piping," as it is called, may be distinctly heard in the hive. It is a noise made by the oldest queen, and sounds something like "peep," "peep," and seems to be answered by the queen in the cell by a sound something like "off," "off." To hear the piping, apply the ear close to the hive in the morning and evening; sometimes it is quite distinct, and may be heard several yards off. As early as eight days after the prime swarm issues, the piping sometimes commences again, indicating preparations for the second or "cast" swarm. Continue to listen for it until the fifteenth day, and if no piping is heard it is evidence that there will be no further swarming, and that the queens have all been destroyed but one, and that she will begin to lay eggs in a few days. If any accident should happen to the queen, or she be taken away before she begins to lay, no more can be reared, as there is no material—eggs less than six days old—out of which a queen can be made. If two, three, or more swarms have issued, the piping should be listened for after each, for as long as there are swarms to issue, it will be heard.

24. A pound of bees contains about five thousand. A good swarm should contain three pounds at least, or fifteen thousand bees; sometimes there are five times as many, or seventy-five thousand—fifteen pounds. It is estimated that a colony can not exceed eighty-four thousand at any one time, as the queen can not lay over that number of eggs, before all of the bees, alive when

she commenced, will die off. Therefore, a hive large enough to furnish room and work for that number of bees will never swarm. Such a hive is called a "non-swarmer," and some contend that it is the most profitable way of managing bees, as such a colony will produce from three to five times as much honey as a "swarmer" hive. They are well suited to persons only desiring a few colonies. As the section bee-hive can be made of any dimensions, it is easily converted into a non-swarmer. If made to contain three thousand five hundred cubic inches in the brood-chamber, and four thousand cubic inches in the honey-boxes, it will never swarm. The brood-chamber should be formed of twelve sections, each 12x18 inches, with three tiers of honey-boxes, each formed of twelve sections 5x8 inches. The brood-chamber will contain three thousand seven hundred and thirty-two cubic inches, and the honey-boxes, in the aggregate, four thousand and fifty, and the latter will hold about one hundred and fifty pounds of honey.

## CHAPTER II.

## BEE-HIVES.

UNTIL within the last fifty or sixty years, little improvement was made in the management of bees. Their hives remained then as they were a thousand years before—a simple, square box, a section of a hollow tree, or the still more primitive straw-hive, of sugar-loaf shape; from which honey could only be taken by the murderous method of destroying the bees. Huber constructed the first frame-hive, which was simply a number of frames, in each of which was placed a comb, as a guide, and all hung on hinges to open like the leaves of a book. This was called a "Leaf-Hive."

Dzierzon used bars, placed in rabbets across the hive, so they could be slipped out and in, to which the bees built their comb. Under that arrangement the bees attached their comb to the sides of the hive, which had to be removed by a knife. To obviate this, Henry Taylor, an Englishman, about 1838, added the side-bars, and finally added the bottom-bar, thus completing the frame, which was suspended in the hive, as he says, "so as not to touch the sides or bottom." W. A. Munn also claims to have invented the "Bar and Frame Hive" of which he published a description in London in 1844. He used first the oblong, square frame. In 1851 he constructed the triangular frame.

Rev. L. L. Langstroth was the first to introduce the movable comb, or bar-frames, in the United States, for which he obtained a patent in 1852; since which a number of hives have been patented, in which the frame was the most prominent feature.

The introduction of the frame or movable comb-hives was the beginning of a new era in bee-culture. It became a certainty. New colonies could be made without letting the bees swarm out in the natural way; swarming could be restricted, and even prevented altogether; weak colonies could be rendered strong, by adding bees and stored honey to them from stronger hives, or by uniting two or more weak ones; new queens could be introduced when the old ones were lost or destroyed; excessive breeding of drones could be prevented by destroying the drone-comb; and perhaps the most im-

portant advantage of any, or all of these, was the prevention of the destruction of the bees by the moth, by being able to keep the colonies in such strength that they could defend themselves, their combs and their stores ; or in case the moth should get in, being able to cut them out and destroy them.

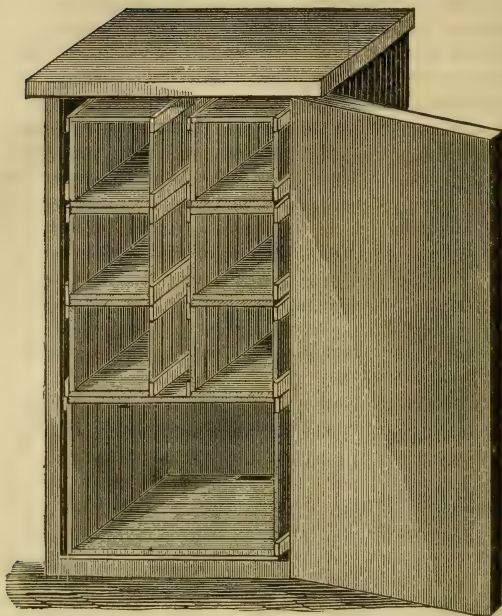
While a long stride has thus been made toward perfection, it has not yet been reached. Many modifications of frames have been made to correct faults which they all have, and which all loose or movable frames always will have, under any of the different manners of constructing them, and using them in the solid box hive. However well they may work at first, while they are new and not gummed and glued up by the bees, and while they are straight and square, they soon become warped and obstructed, so that they are a great annoyance to the bee-keeper ; and in the course of a year or two they are almost, if not entirely worthless, for the purposes for which they were intended.

To remedy this and other imperfections, I have invented and constructed a hive on an entirely new principle. I call it

#### *The Section Bee-Hive.*

It is made by forming the different chambers, apartments and honey-boxes of a series of vertical sections or rims, so fitted to each other as to form close boxes of the size and length required. By an entirely new and simple device I compel the bees to form the sheets of comb just where it is desired ; so that when the sections are taken apart none of the comb will be broken. Or the main, or brood-chamber, may be made to inclose frames, if desired, in which case the sections are made deep enough to hold two or more frames, one of which is attached to the section, the others set in loose. The whole is inclosed by an outer case or box for protection from the weather.





D. L. ADAIR'S BEE-HIVE.

*Description of D. L. Adair's Section Bee-Hive.*

The hive is composed of, first, the brood-chamber, which is generally thirteen inches wide, thirteen and one-half inch long, and ten inches deep, inside measurement, and contains 1755 cubic inches. It can be made of any size or dimensions, either way. For those who prefer it deeper, (which I think unnecessary,) it can be made narrower, so as to contain about the same space. The brood-chamber is formed of nine vertical sections, or rims, each one and one-half inch wide. The top and bottom-pieces are fourteen inches long, one and one-half inch wide; the side-pieces are ten inches long, and the same width—all of them one-half inch thick. They are nailed together, one nail in each corner, the top and bottom-pieces to the ends of the side-pieces, and pro-

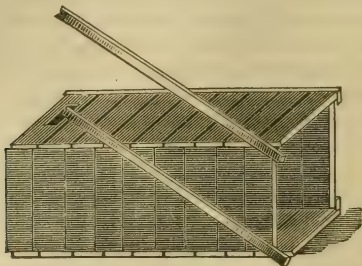
jecting in front three-sixteenths of an inch, and setting back from the edge of the side-pieces the same distance in the rear.

When two of these sections are placed together, the projection of one fits over the shoulders of the other, thus holding them true, horizontally. When nine of them are thus fitted together, a strip thirteen and three-fourth inches long, one-half inch thick, and one inch wide, is screwed to each corner, lengthwise, on the side, thus holding it true every way. It is only necessary to put two screws, in each strip, into the two end sections—the projections and shoulders, with this assistance, hold every one to its place.

The back section has two holes, three inches long and one-half inch wide, one and one-half inch from each end of the bottom and top-pieces, and five inches apart, for entrance-holes, and passages to the honey-boxes. The back end is closed by a board one-half inch thick, thirteen inches wide and eleven inches long, slightly nailed to the bottom and top-pieces, to close the back end of the chamber. The front end is closed with a pane of glass ten by fourteen inches, held in by pieces of tin or small tacks. The underside of each top-piece is covered with cotton-flannel or other soft fabric, pasted or glued on, to prevent the bees from starting any of their combs anywhere except on the guides. Guides are placed in the center of each top-piece over the flannel. Two kinds of guides are used :

*First.* Pieces of wood one-fourth inch thick, one-half inch wide, and twelve inches long, with one edge made very thin, and coated by being dipped in melted bees-wax, are sprigged on ; second, pieces of cord, about one-eighth inch in diameter, or larger, and twelve inches long, are dipped in bees-wax melted and mixed with one-fourth its weight of rosin. The cord should be open and soft—something like candle-wick is best. These are warmed and pressed against the flannel, to which they will adhere, but for fear the flannel may not be securely pasted to the top, they should be fastened by three or four small tacks or sprigs. One-half the guides should be of wood, and the other half of waxed cord, alternating with each other. Where pieces of honey-comb can be had, the flannel may be omitted. Pieces of comb, four to six inches long, and one inch wide, may be fastened to the sections by first coating the underside of the section-top with the hot rosin, with a brush, and, while warm, pressing the comb against it, which will fasten it tight. If you have not sufficient comb to put in all the sections, if every other one, or every third one, contain comb,

the other may be filled with either of the other guides, without using the flannel. In that case the cord guides will adhere without the tacks.



SECTION HONEY-BOX.

*Second.* The *honey-boxes* are formed of similar sections, only varying in size. The top and bottom-pieces are six inches long; the side-pieces, five inches long,—are put together in the same way, with the same number of sections—and are of the same length—as the brood-chamber. The pieces are one-fourth of an inch thick. The back end is closed by a piece five and one-half inches square, sprigged to the top and bottom-pieces. The front end is closed by a piece of glass five by six inches. One passage-hole is cut in the front side of the top, and one in the bottom-piece of the back section, three inches long and one and one-half inches from each end. Guides are used as in the brood-chamber.

Four honey-boxes are used in each hive. Two set on the brood-chamber, with the passage-holes corresponding with the passage-holes in the top of the brood-chamber; the other two are put on the top of the first two, with the passage-holes corresponding. The top passage-holes are closed by tacking over them thin wooden strips. The bees pass through the lower tier of boxes to get to the others. Four boxes, of the size used, will hold about fifty-two pounds, or about one pound to the inch in length. Six or more boxes can be used on one hive, by having the case (which is next described) sufficiently high to receive them.

*Third.* The case is made of inch-boards, is sixteen inches square, and two feet high inside—the front side closed by a door sixteen by twenty-five inches. The bottom board is sixteen inches long and eighteen inches wide. The two side-pieces are twenty-

five inches long, and are nailed to the ends of the bottom board, and also to the side of the back-piece, which is sixteen inches wide, and twenty-four inches long, all even to the top. The bottom board projects two inches at the back, for an alighting board, and is bevelled off to shed the rain. It sets back one inch (the thickness of the door), from the front. The entrance-holes are cut into the bottom board one-half its thickness, three inches wide, and extending back five inches. They are five inches apart, and two and one-half inches from the ends, extending under the back of the case, and two inches further. A wooden strip—twelve inches long, three and one-half inches wide, and one-half inch thick, with two holes three inches long, one-half inch wide, one inch from the front, and two from the back, one-half inch from the ends and five inches apart—is nailed over the holes in the bottom board, inside, against the back. The bees pass in under the back board and under two inches of this strip, to pass up through the holes, which, when the brood-chamber is in place, will correspond with the entrance-holes in its bottom. Two strips, one-half inch square, and sixteen inches long, are nailed on the bottom board, from front to rear, twelve inches apart, so that their back ends come against the end of the entrance-strip, just described, upon which the brood-chamber sets, and slides in and out, and which raises it up to the level of the entrance-strip. Two other strips, one-half inch square and two feet long, are nailed against the back board, inside, to keep the brood-chamber and honey-boxes from going back to the back boards, for the purpose of leaving an air-space between them and the back, and the case being larger than the brood-chamber on every side, the said air-space extends all around, as well as under it.

The section bee-hive has the following advantages over any other now in use :

It has all the advantages of the movable comb-hives, with none of their inconveniences.

It has no loose or disconnected frames to be getting out of place or order. When frames are used they are so constructed, and arranged in the hive, that each one is fixed to its place, and yet they can be operated with greater ease than those of any other hive.

The hives can be used with or without frames with equal success.

The bees can not gum or glue the frames, or sections, so that each piece of comb can not be handled separate from the others.

It is upon an entirely new plan.

It is warmer in winter, and cooler in summer, than any other hive.

The size of the working, or brood-chamber, can be contracted and enlarged at will, to suit the size or requirements of a colony.

Artificial swarms can be more easily made than on any other plan.

It can be more easily Italianized, as every bee can be seen and handled, and not one left in the hive. In fact, when it is completely opened out, there is no hive left, except an empty outer case. Thus there is no chance for the queen to dodge into some corner where she can not be found.

The surplus honey-boxes are in close communication with the working-chamber, and also with each other, and the bees work in them with certainty.

The honey-boxes can be used to the full capacity of the bees to fill them, and they can be forced to work in all of them at once, thereby doubling the quantity of honey made on any other plan, in any other hive.

The surplus honey-boxes can be made of any convenient size, either before or after they are filled with honey.

Each piece of comb can be readily removed, at any time, without having to wait until the whole box is filled. Thus the bee-keeper can have honey in market earlier than from any other hive, thereby securing a better price.

The honey is in better shape for market. It can be divided into pieces of from one to two pounds, without breaking a cell or losing a drop of honey; thus suiting it to the small retailer, and for this reason it will bring a better price.

Out of the partly filled honey-boxes, filled boxes, of any desired size, can be constructed, thus making marketable as "box-honey" a large portion of honey, which, under any other system, would have to be sold in bulk, or strained, which never brings as much by twenty-five to thirty-three per cent.

For family use, just what honey is needed can be taken from a box without breaking what is left, and the box closed hermetically; and the box will be full until all is gone, thus keeping in the best condition, until all is used.

The honey-boxes can be applied to any of the hives now in use, that use boxes, caps or drawers, whether it be a round log, a common box or any of the improved hives.



## CHAPTER III.

## DIRECTIONS FOR USING THE SECTION BEE-HIVE.

THE space between the bottom of the brood-chamber, and the bottom board of the case, should be kept covered at least one-quarter inch deep with fine salt. This will keep ants, moths, and other vermin, from building their nests in, or frequenting the hive, and will preserve the lower part of the hive from decay.

See that the brood-chamber is in the center of the case, and pushed back as far as it will go, so that the entrance-holes agree exactly. A wooden strip, just the thickness of the air-space on each side of the brood-chamber, should be slipped in each side of it, as a gauge by which to regulate it.

See that the guides are in place, in all the sections, before introducing bees to the hive; and, unless at least every third section contains a piece of comb, cover the under side of the top of each section with cotton-flannel, by pasting, or gluing on, and sprig, or tack on the guides over that—using the wooden and cord guides alternately.

See that the hive sits level every way. This is important when the bees are building comb, as they will build it plumb.

The bees will commence work next to the entrance always, in brood-chamber as well as in honey-boxes, and work back toward the glass. They should be examined occasionally, as they progress, to see that they place the combs correctly on the guides. If, from any cause, they should fail to do so, you should correct them before they go too far, by taking out the section, or sections, that have not the comb on the guides, and placing them properly. If you open the chamber, after they have worked on several of the sections, shift them, by separating them, and placing the empty sections between them, so as to have every other one, or at least every third one, partly filled with comb.

The bees will generally commence and finish the lower tier of honey-boxes, before they commence in those above. When they have worked in three or four sections (which you can see through the glass), shift the bottom boxes to the top, bringing the others

down, so as to compel the bees to pass through the empty boxes. This separates their stores, and they will immediately commence work in the empty boxes, and work with redoubled energy to connect them; and by this means all the boxes will be filled nearly as soon as the two would have been, had they been let alone.

When any of the boxes are filled, take them out, putting empty ones in their places; but *never place an empty box on top*, while you have one in which the bees are working, which you can place over it. If all the boxes are full, take out only two at one time, placing empty boxes under those left in; and when the bees get them one-third full, take out the full top boxes, and put empty boxes under the others. Do not wait for every cell in the last section to be filled and covered over, for frequently the bees leave a few cells in that, which they are a long time sealing over. When the last sheet is about filled, and, for several days, there seems to be no more done to it, take the box out, and give them an empty one below. Bees are lazy, if there is any excuse for it; but by this management, they are kept at work as long as there is any honey to gather.

If you see your bees laying out idly, in clusters around the entrance-holes, during the honey season, you can generally put them all to work in twenty-four hours, by shifting the boxes, and giving them empty ones between their brood-chamber and their surplus stores.

If any of your colonies, which seem to be strong, are not working in the honey-boxes, when they have their brood-chamber well filled with comb, take two boxes from a hive that is working in four, or from two separate hives, and, after emptying the bees out, place them on the lazy hive, directly on the brood-chamber; they will soon set about completing them. In three or four days you may shift them to the top, and they will work in all the boxes.

If a colony should be working in one box only, bring the empty box above it down, and place the partially filled box on top, until the bees commence work in three or four sections of the box thus brought down, when you should lift it up to the top of the other pile, bringing the top box from there to fill its place below, and you will soon have them working in all the boxes. Or, take part of the sections from a full box, and combine them with empty sections, to form a full-length box, and place it under the pile, in

which there is no work going on, and you may thus induce the bees to work there. When fairly at work shift to the top.

Sections may be taken from the first boxes worked in, and placed in boxes on all your other hives, as an inducement to begin in them. When you once get them started (if there are bees enough to do it), you will soon have all filled by following the foregoing directions.

All the empty combs should be carefully saved, and if not used as guides in the brood-chambers, should be placed in the honey-boxes. It saves a great deal of time and trouble, as well as honey. Bees will store three times as much honey if the empty comb is provided, as they will if they have to make the comb. None but new white comb should be used in the honey-boxes. Drone-comb is as good as any. The dark old comb should be used in the brood-chamber. Each pound of comb is worth at least ten dollars to the bee-keeper.

When you wish to take off a honey-box, have two pieces of tin or zinc, five or six by fourteen inches; insert them both, one at a time, under the box, full-length—first lifting the end of the box a little, so that they will go under with ease. Draw out the box with one piece of tin, which will cover the passage-hole, and prevent the bees escaping. Leave the other piece of tin to close the hole in the lower box, or chamber. If the bees are busy gathering honey, the box may be set down anywhere with the holes open, and the bees will leave it. If it be late in the season, it should be taken to a dark cellar, or room; for, if set down where the bees can get to it, when the honey supply is scarce in the flowers, they will soon carry it all off. I usually, at this time, set the boxes in a barrel with one head out, or in a box with the top off, and cover with a thin cloth. The bees will leave the box, and cluster on the cloth. In about one hour I turn the cloth over, and release what bees are on it. The remaining bees will come out, and cluster on the cloth in the same way, when I again turn it, and repeat until all are out. The barrel, or box, may be filled with boxes, set across each other so as to leave both holes open in each. You should have at least three pairs of these tins to answer all uses. When the bees are all out, have a strip of cotton cloth, coated with bees-wax two parts, resin two parts, and tallow one part, which place over each hole, and over that a piece of thick paper, and rub with a hot iron until they adhere, when it is sealed up air-tight, and is ready to put away, or for market.

Another method, suggested by a gentleman of New York, to Mr.

Quinby, and recommended by him, I have never tried, but it has some advantages. The following are Mr. Quinby's directions: "He designates each hive with a number, and when the boxes are put on, each box receives the same number as the hive. When a box is full, an empty one to replace it, is numbered in the same way. \* \* \* \* \* The empty box is put on the full one, and the slide removed, giving the bees free passage to the upper box. Any number of boxes may be set on one board, and by striking the board gently, with a stick, or hammer, the bees immediately leave the full, for the empty boxes; then the slide is inserted, and each box containing the bees returned to the hive to which it belongs, which is known by the number. If a large number of boxes are to be taken off at one time, it will be necessary, without a corresponding number of slides (pieces of tin, as described in this chapter—*D. L. A.*), to use pieces of glass, or wood, to lay over the holes in the tops of the hives, while other boxes are being taken off. The advantages of this method are, that no bees can fly to annoy any one; and all young bees, that have never before left the hive, and are usually lost, are returned; the bees are already in the box and go to work sooner; the honey in the box is clean, etc." The full box should be inverted, before putting on the empty one, as the bees will pass out more readily, at the regular passage-hole. Strike lightly, as too heavy knocking would dislodge the new, brittle comb. This is the same principle that is applied to "*Driving or Forced Swarming*"—(see that head).

Honey-boxes should never be left on the hives, after they are full, as the bees, running over the comb, will soil it, and, besides, it encourages idleness.

When a hive has more boxes, partly filled, than they will likely complete, take all of the full sections out of them, and combining the partly filled sections, into a fewer number of boxes, return them, or give them to the strongest colonies, that have filled their boxes, to finish.

Should a hive become so populous, that there is no room for them all to work, and, after following all of the methods pointed out in this chapter, there is still a cluster on the outside of the hive, remove two or three of the full sections—alternate ones—giving them empty sections in their places. The full sections may be given to weak colonies, or to late swarms, thus rendering them strong and valuable. The brood in them will add to their numbers, and the comb will be worth many pounds of honey to them.

Swarming may be prevented, by opening the hives, at intervals of two weeks, and destroying, or taking out the queen-cells. If done at the proper time, and thoroughly, three times is sufficient; but, unless the space in the hive and honey-boxes is large, the colony will become so populous that the workers will store all the brood-cells full of honey as fast as the young bees mature and emerge from them, thus leaving the queen no room to deposit more eggs. There being no young to hatch, and the bees continually dying from age, and the number decreasing, there are fewer to consume the stores, the honey remains in the cells, the colony grows weaker, from day to day, and the chances are that they will fall a prey to the moth, or robbers; or, if they escape these, they are in a poor condition to pass the winter. If the colony survives the winter, it may continue weak and unproductive. The remedy, in such a case, is to take out a part of the sections, so filled with honey, and replace them with empty ones, or with sections containing empty comb, or partly filled with comb from weaker colonies, giving to the weaker colonies the full comb.

Of all difficulties with which bee-keepers have had to contend, there has been none so great as that of wintering bees successfully. Some house them, or put them in cellars; this is troublesome to the bees and owners, and far from satisfactory. Some put them in clamps, or have a box made to set over each hive on its stand; this is, perhaps, better, but is expensive. From ten to twenty-five per cent. of the bees kept in the northern States are annually lost in wintering. The section bee-hive, I believe, remedies the difficulty perfectly. It is only necessary to fill the air-spaces, between the brood-chamber and the case, with dry saw-dust, or grain-chaff, and put some old woolen rags, pieces of old blanket or old carpet, between the door and the glass, and you have the bees in their winter quarters, snug and warm, without moving them from their stand, or interrupting them in the least. Two empty honey-boxes should be left on the hive, with the two lower passage-holes open, and the saw-dust or chaff filled around, between and over them. After all the cold weather is over, the saw-dust may be removed, the bottom freshly salted, and the trouble is over; or the saw-dust may remain in until you have occasion to take out the brood-chamber for artificial swarming, or some other purpose.

Some writers on bee-keeping, attach great importance to breeding bees only in new comb. At least one patentee claims that the "main object, of his improvement, is to renew the comb once or



twice every year." He further claims that "the only way to make the bees strong is to renew the comb and never allow your bees to breed in the same comb the second time." The "*Cottage Bee-Keeper*" says "renovation of comb should take place not less often than once in every four or five years." The idea seems to be that the cells become smaller, from the accumulation of cocoons spun in them by each generation of bees, and that each new brood becomes smaller, and weaker, from having to conform in size to the cells in which they are reared. Mr. Langstroth says, in reply to this suggestion, that old comb dwarfs the bees: "When I find such a colony, I shall think it worth while to give specific directions as to how it should be managed. The truth is, that of all the many mistakes, and impositions, which have disgusted multitudes with the very sound of "patent hive," none has been more fatal than the notion that an old colony of bees could not be expected to prosper. Thousands of the very best stocks have been wantonly sacrificed to this chimera; and so long as bee-keepers—instead of studying the habits of the bee—prefer to listen to the interested statements of ignorant, or enthusiastic, or fraudulent persons, thousands more will suffer the same fate. \* \* \* \* What old bee-keeper has not had abundant proof that stocks, eight or ten years old, or even older, are often among the very best in his whole apiary, always healthy, and always swarming with almost unfailing regularity." Mr. Quinby says, in the *American Agriculturist*, for September, 1858: "I have known combs half that age (twenty-two years), to be used for brood, and the bees bred in them *could not* be distinguished from those reared in new comb."

Destroying the old comb, to prevent dwarfing, is not only useless, but decidedly injurious, as it keeps the bees employed making comb, when they could be, and would be, more profitably employed in storing honey. The time lost, and the honey consumed, in making one pound of wax, is equivalent to twenty-five or thirty pounds of honey lost. If there is ever any necessity for pruning out old comb, it is evidently only at long intervals, and our advice is, wait until you see your bees reduced in size, before you undertake it; we would even wait longer, and see for ourselves, whether they would not prove just as efficient as the larger ones. Is it not to be wondered at, if dwarfing is an injury, that all of the Italian bees, that have been introduced to hives filled with common worker-comb, are not dwarfed, degenerated, enfeebled and destroyed by the moth?



## CHAPTER IV.

## HOW TO HIVE A NATURAL SWARM IN THE SECTION BEE-HIVE.

TAKE out the brood-chamber ; stop the entrance-holes and passage-holes to the honey-boxes, and remove the glass. See that the tops of the sections are covered with the cotton-flannel and that all the guides are in place, and arranged as before directed, under the head of "*Description of Hive*" and "*Directions for Using*;" Chapters II and III. Lay down a broad plank, or planks, with one end considerably higher than the other, upon which a sheet may be spread, if desired, though not necessary. Place the brood-chamber on the highest end of the plank, open end down ; elevate the lowest side, by placing a block or stone under it, so that it will set about level ; shake the bees down on the plank, as near the chamber as convenient, and they will immediately start up toward the brood-chamber, which they will enter with but little trouble ; should a small number crawl up and cluster on the side of the hive, let them alone, they will eventually go in. If a large number should do so, they should be brushed down on the plank, again and again, till they go in. Or, the swarm may be shaken into the open end of the chamber, held under them. When they are all in replace the glass and take the chamber to the case, where it is intended it shall stand, and after opening the entrance-holes put it in place.

A better way is to have a solid box the same size of the brood-chamber, with glass in one end, and two holes corresponding with the holes on top of the brood-chamber. I call it a swarming-box. The glass should be set in a frame and fastened on by the hooks, so that it may easily be removed and replaced. Hive a swarm in this as directed above. Have a hive ready on its stand, with brood-chamber in, honey-boxes out. The brood-chamber should have some comb placed in it as an inducement not to desert it. A sheet or two of brood-comb, taken from a full hive containing brood in different stages of development, fitted into the sections as directed under the head of "*Transferring*," is a sure preventive against desertion, and as it can be easily taken from a hive that

has just swarmed, there being so few bees left in it, it should always be done. If a box-hive, apply smoke, turn the hive up and cut out two or more pieces of comb, six or eight inches deep and wide enough to reach across the section. If a frame-hive, take out two frames, divide them each horizontally through the middle, making two pieces out of each frame, and fastening them into four sections, as directed under the head of "*Transferring and Dividing*," alternating the sections containing them, with the empty sections, putting guides on the latter alone.

Place the swarming-box, containing the new swarm, in the case on top of the brood-chamber, with the passage-holes corresponding and open. If the brood-chamber has the sheets of comb, with brood or honey in them, or empty honey-combs, the swarm will soon descend and take possession, when the swarming-box should be removed and the passage-holes closed, until the bees get fairly to work, when the honey-boxes may be put on. If the brood-chamber has no comb placed in it, it is sometimes difficult to get the bees to go down from the swarming-box to the brood-chamber, and when that is the case, it is best to hive the bees in the brood-chamber at once, as first directed.

These directions apply to hiving swarms issuing from box or frame-hives. See next chapter for directions for managing swarms from section hives.

## CHAPTER V.

## HOW TO MANAGE A SWARM OF BEES FROM A SECTION-HIVE.

IF artificial swarming be neglected, in the section bee-hive, and a natural swarm be thrown out, they should be immediately hived in a swarming-box.

After securing the swarm in the swarming-box, proceed to take out the brood-chamber, from the hive that sent out the swarm, placing two of the honey boxes in its place, to receive such bees as may return while it is out. Open the brood-chamber, and take from it the two end-sections next to the glass, supplying their places with the two end-sections from the new brood-chamber, and return the old chamber to its place immediately, placing on it the two honey-boxes, used as decoys, and also the others belonging to it. Take out the glass from the two sections, thus obtained, and separate them, so that the bees that are on them, may be brushed off in front of the old hive. Put the two sections in the new chamber, with one section between the first and the section containing the entrance-holes, and with two empty frames between them; that is, counting from the entrance, one will be No. 3 and the other No. 6. Fill out the chamber complete, and close up. Place it in the case intended for the new swarm, and put the swarming-box on top of it, with the passage-holes open and corresponding, and the bees will, in the course of twenty-four hours, go down and take possession.

The object in giving the new swarm the two sheets of comb is, first, it secures the swarm from absconding to the woods; second, it gives them a start, and will enable them to store a greater amount of surplus honey the first year; third, it secures straight comb in all of the sections, without using the flannel, the guides being sufficient; and fourth, it makes a vacancy in the parent-hive, which will prevent them from swarming again, as, while there is such an opening in their stores, they will permit but one queen to hatch out, destroying all the others.

The most important advantage thus gained, is the assistance you give the new colony, for if it should be wet weather, for a few

days, there is danger of the swarm perishing for want of food ; for although, when a swarm issues, they fill themselves with honey, this is used up, in the secretion of wax, to build their combs ; and such a drain upon their resources soon leaves them without food. Such timely assistance saves them. The queen immediately finds cells for depositing eggs. The bees daily emerging from the old brood-comb, add to the strength of the colony, and the result is, that if it is a first or "prime" swarm, you are amply compensated in an extra amount of surplus honey ; if an after-swarm, you secure them an ample store of honey, and a populous colony, strong enough, and rich enough, to pass the winter safely and a young, vigorous queen, which is sure to prove prolific, and lay the foundation for the most productive stock the next season. If the other sections are filled, or partly filled, with empty combs, even a "cast" may produce a surplus the first year.

The honey-boxes should not be put on for a week or ten days, or until the queen has fully established her brood-nest in the lower chamber ; or if put on, the communication should be cut off.

## CHAPTER VI.

## ARTIFICIAL SWARMING.

THIS is accomplished in different ways, all of which have their advocates, and, under certain circumstances, their advantages. It seems to be the opinion of all scientific and successful apiarians, founded on experience, that, to succeed in bee-culture, the golden rule is "KEEP YOUR COLONIES STRONG." They further agree that this is hardly attainable when they are permitted to swarm naturally. Therefore art has been resorted to and recommended by all of them, from Huber down to the present time. They lay down the following incontrovertible reasons:

The uncertainty as to the time at which natural swarming will occur—very trifling causes frequently preventing it altogether.

Among the many inconveniences to which the bee-keeper, who depends on natural swarming, is subjected, are the following:

*First.* Having to keep a strict watch over his apiary for six or eight weeks, and then, after all his watching and care, he has to endure the annoyance of seeing, perhaps his best swarms, fly away to the woods, with no power to arrest their flight. It is calculated that one-fourth of the best swarms are lost in this way.

*Second.* A small number of hives need as much watching as a large apiary.

*Third.* If a great number of hives are in one collection, several swarms frequently issue about the same time, some going one way, some another; or else, getting together, cluster in an unmanageable mass.

*Fourth.* Bad weather frequently prevents their swarming entirely.

Swarms frequently issue at times when it is important that something else should be attended to.

Swarms frequently settle in places, which, if not inaccessible, are very inconvenient, and it is difficult to hive them.

Colonies frequently overswarm; in other words, too many bees go out with the new swarm, leaving so few behind that they can not guard their stores, and they fall easy victims to robbers, or

the moth. This frequently happens when the forenoon has been cloudy and rainy, keeping all the bees in the hive, and about noon it clears up, the sun shines out, and the swarm will burst forth, carrying with them nearly the whole population.

By taking the matter into our own hands, and carrying it out judiciously, most of these inconveniences may be avoided, and we make the thing sure. We make just such swarms, and just as many, as we want—make them as strong as we want, and keep them so.

By the aid of the section bee-hive, when the proper time arrives, you can go to work, and in a few days take a swarm from every hive that can spare one, and repeat it as often as necessary or advisable.

I have herein given minute directions for performing the operation in a variety of ways, and even though you should only practice the easiest methods, a study of the others will convey to you a great deal of valuable information, which you might not obtain as easily in any other way.

Artificial swarming, as a general rule, should not be attempted until the yield of honey is abundant, in the spring, and the drones have made their appearance in the hive from which the swarm is to be taken; and the stock should be populous enough to admit of the loss of a sufficient number of bees to form the new colony, and still leave enough to cover the unhatched brood, and keep them warm, and to protect their stores.



## CHAPTER VII.

## DRIVING, "DRUMMING," OR FORCED SWARMING.

THIS is resorted to when the stock is in a common box-hive, or any hive without movable combs. A part of the bees, with the old queen, is driven, and those remaining will rear a new queen, either from a queen-cell already formed, or from worker-brood not yet capped over. If there is no queen-cell, nor any uncapped worker-brood, they will fail to raise a queen, and unless furnished with a queen, or the means of rearing one, the stock will not survive the season; but if the operation is performed at the proper time, there is no difficulty about this, as they are always either queen-cells, or young brood, or both, at that time.

One-half of the bees should be driven out to form the new colony—some say three-fourths. The stock in the old hive will soon be as strong as ever, from the young bees daily emerging from their cells, and in ten days, or less, they will have a young queen, who will soon be in condition to deposit a new supply of eggs.

The new hive being ready to receive the swarm, a "driving-box," or, as it is sometimes called, a "drumming-box," is prepared of a size and shape to fit the open end of the old hive, or nearly so. The swarming-box may be used when it is of the proper size.

Blow some smoke from tobacco, cotton rags, or burning wood, in among the bees, to drive them from the entrance, and up among the combs. Remove the hive from its stand, and turn it upside down in some convenient place, some distance from its old stand, in the shade. On its stand place the case of the hive intended for the new swarm. Blow more smoke among the bees, to drive them well down among the comb, and cut out a piece of comb, with brood in it if possible, large enough to fill a section of a honey-box. Have the box open, and fit it into one of the sections, about the center of the box, leaving holes at each upper corner, and under the bottom, for the passage of the bees. Close the box, and place it in the case, with the passage-hole over one of the entrance-holes. If the bees are numerous, one box may not be sufficient to

hold the returning bees; if so, another box should be placed over the first, with the communication open. The bees, returning from the fields, will enter the box, or boxes, so placed, cluster on the comb so furnished, and remain till wanted.

Now, place over the old hive the driving-box, closing any openings there may be between the box and hive with rags, or by wrapping a cloth around them where they join.

With a small stick in each hand, rap, in quick time, on the sides of the hive, but not so hard as to endanger the comb by breaking, or detaching it. Continue to rap until the humming in the driving-box indicates that enough bees have gone up, which will generally require fifteen or twenty minutes; now raise the box, and look in to see if the swarm is large enough. There had better be too many than too few; for, if more are driven out than you want, a part of them can be returned.

When your swarm is large enough, take off the driving-box, and place the old hive by the side of the section-case, not farther off than two or three feet. The queen should be in the driving-box with the new swarm. If she is not, they will soon become restless, and it will be necessary to drive again. But if over half of the bees are driven out, she will, nine times in ten, be with them.

The new swarm may now be hived in the brood-chamber of the section hive, as directed for natural swarms, from the swarming-box. The honey-box, used as a "decoy," should now be opened, and the bees emptied out in front of the old hive, which they will enter. The same box and piece of comb will answer for other swarms, to be driven immediately.

When it can be done conveniently, the brood-chamber should be used instead of the driving-box, only, instead of taking out the glass, remove the wooden back at the other end, leaving the glass in, that you may observe the bees as they pass up, and be able to see when the proper number of bees have gone into it. By replacing the back, it is ready to be put in the case, thus saving the trouble of hiving from the driving-box.

To ascertain whether the queen is with the new swarm, set the driving-box over a dark cloth, or other black substance, for half an hour, and if she is among them, she will have dropped a number of eggs, which may be readily seen. This should be ascertained before hiving them in the brood-chamber. If the queen is not

with them, they will leave the new hive, in an hour or two, and return to the old hive. This may be prevented by taking a section or two containing uncapped brood, from a section hive, and placing them in the new brood-chamber before introducing the bees. If this can not be had, comb, containing young brood, may be taken from the old hive, and inserted as directed in next chapter.

If the old hive be large and heavy, the bees may be driven out without inverting it, by removing the top of the hive, and proceeding as above.

They may be driven any time of the day or night, but drive better in the afternoon, when they are tired by going abroad. If it is intended to make a second artificial swarm from the same old stock, it should not be done sooner than four weeks, as that time will be required for the new queen to be hatched, fertilized, and to fill the brood-combs with eggs.

## CHAPTER VIII.

## TRANSFERRING AND DIVIDING.

BEEs may be transferred from the box-hive to the section-hive, with their comb, brood, and honey; and where the old hive contains enough bees and brood, in the proper condition, the stock may be divided into two, or more colonies. Transferring, without dividing, may be performed at any time from early spring till autumn; but early in the spring is the best time, as then most of the comb is empty and light, and the bees are few in number.

To do this, proceed as directed, in last chapter, for "*Driving, or Forced Swarming,*" except, instead of driving only a part of the bees, drive all you can. After you remove the driving-box, and place it so that the bees may not escape, proceed to take out the comb carefully, so as not to injure the brood that may be in it. Have the sections of the brood-chamber prepared for holding it, by placing in them, perpendicularly—and even with one edge of the bottom and top-pieces—small wooden strips, about one-fourth of an inch square, cut the length of the side-pieces of the sections, and fastened with sprigs through their tops and bottoms—two to each section, about three and a half inches from each side. Annealed wire—about the size of a very coarse knitting-kneedle, run through holes in the top and bottom-pieces, about one-fourth of an inch from the edge—three to each section, and bent so as to hold them steady—is better, and can be drawn out, when necessary, without opening the brood-chamber. Place your sections on a table, or board, with the edges, having the strips in, down.

Cut the comb the width of the sections—a little larger, if any difference—so that it will fit tightly against the sides, and about three-fourths of an inch narrower than the depth of the sections, which may be done readily, by having a pattern, made of a thin board, which may be laid down on the comb, and cut around with a sharp knife. As each piece is cut, place it in a section, being careful to place the same edge up that was up in the old hive. Push it up firmly against the top-piece, and having a strip of wood, three-eighths of an inch thick, and half an inch wide, cut to fit

closely between the two side-pieces; press it up firmly against the bottom of the comb, and fasten it by sprigs, or tacks, from the outside. This will leave a space of three-eighths of an inch, or a little more, between the strip and the bottom-piece, for the bees to pass under. A hole, about one-half inch in diameter, should be cut in each upper corner of the comb, and two others down each side, at equal distances, as such passages are necessary, and it will save the bees the trouble of cutting them.

Your comb is now held in by the strips on one side and bottom. Put in on the other side, which is up, two strips like the first, on the comb, and sprig them in from top and bottom, or insert three wires, as before directed, and the comb is secured in its place.

To accommodate the small pieces of comb, strips, like the bottom-strip above described, may be placed across the sections wherever needed to hold them. Two or three may be used in one section, but where there are enough large pieces to fill the sections, the small pieces should be saved for guide-combs, and such as are new and white should be placed in the honey-boxes, unless they have brood in them. Leave out all the drone-comb, except a piece as large as your hand—more than that would be a positive injury.

In handling the combs, be careful not to mash the young brood; and when a queen-cell is found, be careful not to injure it, but place it carefully in the sections, so that it will not be covered by any of the strips or wires, and if on the edge, see that it is not crowded against the side-pieces, or against other pieces of comb.

When seven sections are filled (if you wish to divide the colony), arrange them in the chamber, adding the two outside ones empty. Leave out the glass. If there is enough material to fill two, or to give each of them five or six sections so filled, arrange both of them, giving to each of them queen-cells, and uncapped larvæ, out of which to rear a queen. Place each of them on a wide board, or cloth (in a house is preferable); empty half of the bees from the driving-box, and decoy-boxes, in front of the open end of each of them, and they will, in a few minutes, enter, when the glass should be put in, and both chambers placed in the same case, one on top of the other, with the passages between them open. Close the entrance-holes of the case with wire gauze, or something that will admit air, but not the passage of a bee, to prevent robbers taking advantage of the disorganized state of the hives. Keep them so closed for twenty-four hours, by which time the bees will have

cleaned up all the dripping honey, and will have distributed themselves over the combs in both chambers, preparatory to nursing the young brood; then the lower chamber should be removed to another case, set by the side of the first, and the honey-boxes placed on each.

If one hive seem to have more bees than the other, after they have been separated twenty-four hours, move the hive having the most bees half its width to one side, and place the other hive by its side, putting a division-board between them, so as to project a foot in front, in order to equalize the colonies. If this does not do it, move the strongest hive two feet further, and place the other on its stand. If still too unequal, move the strongest hive some distance off.

After three or four days, the combs will be all attached to the sections, so as to support themselves, when the chamber should be opened, and the side-strips taken out, leaving the bottom, or cross-strip, in.

When there is not enough comb to fill out all the sections, it is better to fill all of them one-half or two-thirds full, than to fill one-half or two-thirds of them full, leaving the others empty. It is easily done, by cutting the comb of that depth, and placing the bottom, or cross-strips, under it as directed. The bees will continue the sheets down, and finish them out.



## CHAPTER IX.

## TO TRANSFER FROM A FRAME-HIVE TO THE SECTION-HIVE.

BEES and stores may be transferred from any of the movable frame-hives to the section-hive by placing the frames, full of comb-honey and brood, in the sections, and fastening them to the top and side-pieces, by sprigs, or small finishing nails, from the outside; first making holes with a sprig-awl, so as to not jar the comb by too heavy driving. The projections of the frames should be sawed off with a fine tenon-saw, and if the frames are too deep, or too wide, to go inside the sections, a part of the frame may be sawed off, taking off the bottom or side-bar and so much of the comb as may be necessary. Be careful to leave near a half-inch space under the bottom, and to cut holes in each upper corner of the comb, for the passage of the bees.

If you wish to divide the swarm at the same time, divide each of the combs horizontally through the middle, and place a half-sheet in each section, proper side up. To divide them, cut them straight through the middle, and saw the side-bars in two; place them in the sections, and in putting the chambers together, let the top and bottom-pieces of comb alternate with each other. Most movable frame-hives have ten frames, and as the section-hive has but nine, there will be one frame left; to obviate this put in two full frames and divide the other eight, which will just fill the eighteen sections. If there should be twelve frames, put in six whole sections and divide the other six.

As each frame is taken out, the bees should be brushed back into the hive, and if the queen is found, she should be caught and placed under a tumbler, or in a cage, until wanted. If any queen-cells should be found, one of them, as also some uncapped worker-cells, should be given to one of the new colonies, and the queen to the other.

Give to each of the chambers about one-half of the bees, by emptying them before the new chambers, with the glass out. Put in the glass, and place each chamber in a separate case, each case occupying half the space occupied by the old hive. Close the

entrance-holes as before directed, until the dripping honey is cleaned up, and equalize the bees, as under the head of "*Transferring and Dividing*," page 34.

The side-supporting strips, or wires, should be used to hold the combs in place, unless the frames fit the sections firmly, and the bottom-bar of the frames should always be taken off, and a cross-strip placed under the sheet of comb, and nailed through the sides, as directed under the last head, page 34.

## CHAPTER X.

## HOW TO MAKE SWARMS BY "DIVIDING."

*First Method.*

HAVING your bees in the section-hive, this becomes a very simple operation. In order that your sections may be used in any hive, they should all be of the same dimensions, so that a section from any hive will exactly fit any other section, in any other hive.

Puff, or blow smoke into the entrance (driving in all of the bees lying out), until the bees are subdued, but not enough to sicken them. Have four pieces of tin, five by fourteen inches; insert one piece of tin under each pile of honey-boxes, between the box and brood-chamber; thus cutting off any bees that may be in the honey-boxes. Insert the other two pieces under the first two; draw out each pile of boxes, with one piece of tin under it, to keep the hole closed, leaving the other pieces to cover the holes in the brood-chamber; set the honey-boxes in a secure place, keeping the bees imprisoned; take out the brood-chamber, and place in its stead, two empty honey-boxes to receive the returning bees. With a knife, or sharp instrument, inserted between the sections, open the chamber, between the fourth and fifth sections, counting from the back or entrance. Before it is opened wide enough for the bees to escape, blow in a profusion of smoke, to drive the bees behind the comb. If there are young larvæ, or brood, in the combs, when divided, the nursing bees will not leave—the others will. Now separate the two parts and fill out each with empty sections. The one having the largest number of full sections should have two new sections placed on each end. The open end should have the entrance, or back section, with back in, and a plain section put on it, and the glass should be removed from the other end (first dipping a cloth in very warm water, and applying it to the edge, of the glass to soften the propolis or glue with which the bees have fastened it), smoking the bees back when sufficient opening is made to blow the smoke in, and the other two sections added with the glass in the last one. Fill out the other chamber with empty sections, with glass in the last one. Guides should be placed in the empty sections of the first chamber, if you have no guide-combs.

In the latter, unless at least two out of the five have pieces of comb as guides, each section should, in addition to the guides, be covered with the cotton-flannel.

Place one of the chambers in a case about two feet to the right of the old stand, with half of the honey-boxes, and one "decoy-box," on it. Put the other in a case, two feet to the left, with the remaining honey-boxes, and the other "decoy-box," on it. To equalize the swarms, proceed as directed under the head of "*Transferring and Dividing*," page 34. This is the simplest, and easiest plan of making artificial swarms, causing little disturbance to the bees, and no handling of the honey or combs. In this respect the section bee-hive has a great advantage over the popular frame-hives.

You thus have two colonies, each hive partly filled with comb, brood and honey. One of them has the queen, and if the operation has been performed at the proper time, as Huber says, "the probability is there will be '*royal brood*' coming forward in the other; at all events there will be plenty of eggs and larvæ of the proper age, for forming an artificial queen."

In this latitude (Kentucky), the first division may generally be made in the latter part of April, or first of May, which depends on the season being favorable. The appearance of the drones in the hive indicates the proper time, and if honey be abundant the chambers of both hives will be filled in from twelve to twenty days, when the one having the queen may be again divided, and the other in four weeks from the time of dividing; thus making four from one. If the honey-harvest is good, and continues long, a third division may be ventured on, if the increase of bees is more desired than the honey; for if you expect your bees to store much honey, you must be content with one or two divisions.

If the old stock is very strong, it may be divided into three equal parts, at the first division. If not so strong, five may be made from two, giving to the divisions, containing the entrance-holes, three sections each, and to the others four sections each.

#### *Second Method of Dividing.*

Proceed to take out the honey-boxes, and brood-chamber, as directed. Place an empty brood-chamber, or the swarming-box, in the case. Have a wide board, six or eight feet long, and place it in front on the hive, with one end on the alighting-board; but

not so as to close the entrance holes ; the other end on the ground. On this spread a sheet, or white cloth. Place the brood-chamber on the outer end of the board, and proceed to open it ; meanwhile quieting the bees with smoke ; but, instead of only opening it in the middle, separate all of the sections, beginning at the glass front, or end. Take them off, one at a time, and brush the bees off on the sheet ; the first, near the entrance of the old case, so that they will go up and into it ; or, you may dislodge the bees from the comb, if it is not too new, with a quick downward shake, holding the comb perpendicularly, to prevent breaking it.

*Keep a strict watch for the queen, both before and after shaking the bees off*, as the object you have in view is to catch her. The bees will crawl up the inclined board, and enter the case containing the empty brood-chamber, or swarming-box. Notice them carefully, and if you see her on the sheet, turn a glass tumbler over her. If you find her on a piece of comb, either catch her in your hand, or shake her off on the sheet, and secure her with the tumbler. If the queen is found before you clear all of the comb of bees, the others need not be looked over, nor the bees dislodged.

Now construct out of the sections two brood-chambers. In one of them place two sheets of comb ; one of them mostly filled with brood ; the other with some honey in it, and fill out with new sections, with flannel covering, and guides on, as before directed, or with pieces of spare comb in each, or better still, filled with empty comb. In this *place* the queen.

Put the remaining full sections in the other chamber, filling out with two empty sections, with guides alone, or comb in them.

Take out the decoy-chamber, or swarming-box, from the case, and place therein the chamber containing the queen, and put all of the honey-boxes on it. Put the other chamber in a case to one side, about two feet off, and on it the swarming-box, or decoy-chamber, with the passage-holes open, so that the bees may pass down into the brood-chamber containing the combs. When they have all gone down, take off the swarming-box, and put on honey-boxes. To equalize the swarms, proceed as directed under head of "*Transferring and Dividing*," page 34.

After both hives are arranged, there will be, likely, some bees left on the sheet, too young to find their way up to the old hive ; they should be emptied at the entrance of the new hive, which they will enter.



*Third Method of Dividing.*

Having three, or more, colonies in section hives, take two filled sections from each, until you get six or eight, brushing off the bees, so that none of the hives may be robbed of their queens. Fill their places with new sections. Construct from them, and such new sections as are needed, a full size brood-chamber.

Remove the brood-chamber from an old and populous colony and put the new chamber in its place; or, if not a section hive remove the hive from its stand a rod, or more. When the bees are flying out freely, place the chamber in a new case in its place, and the returning bees will make the new colony. Equalize, as before directed.

The bees, to form the new colony, may be furnished in another way—without drawing so heavily on the population of any one hive—as follows: Examine your strongest colonies, and you will find a number of the empty and partly filled honey-boxes full of bees, and apparently idle. These are mostly young bees. Take one box each, out of four hives, and, after smoking them, so as to destroy their natural scent, and make them all smell alike, put them in place over the newly constructed chamber, and they will soon go down, and take possession. Confine them, by closing the entrance-holes with wire gauze, for two days, and they will remain perfectly satisfied. If you think there are not enough bees, you can add more when they have gone down from the first boxes.

Let me particularly caution you not to neglect to smoke the boxes of bees before putting them together. If this is neglected, a general battle will ensue, in which many bees will be destroyed. If a little smoke is blown into each of the boxes, they will be all of one scent, and unite peaceably.

This is a little more troublesome than the other methods described, but has some advantages over either of them. Two combs taken from each old stock, will not seriously disturb them, but they will use extra exertion to fill up the gap, and continue to work in the honey-boxes: you at once set up a colony, with nearly full-brood-chamber, and if the bees are furnished by means of the honey-boxes, they are already, perhaps, storing surplus honey.

It may be repeated with the same hives, every eight or ten days during the honey season. On the tenth day the new colony may be divided, if no queen-cells were given it, when first made, as by



that time there will be a number of finished royal-cells. Each sheet of comb, having such a cell, can be taken out and combined with two or more filled sections from other hives, and a sufficient number of empty sections to form a new chamber—the requisite bees being furnished by means of the honey-boxes, as before, or by removing an old hive from its stand a rod or two, and placing the new hive in its place.

*How to make Three Artificial Swarms by Opening but One Hive.*

When the drones first make their appearance in the hive, take out the brood-chamber, put the swarming-box in the case, with the passage-holes corresponding to the entrance-holes, to receive the returning bees. Open the brood-chamber, and separate the sections one by one; brush off all the bees from each sheet of comb, as they are taken out, in front of the old case, that they may enter the swarming-box. Have three new hives, with brood-chambers. When two sections are cleared of bees, open one of the new chambers, and take out two empty sections—the third and sixth (counting from the entrance)—and place the two full sections in their places, and close it up without any bees. Take two more out of the old chamber, and in the same way insert them in a second new chamber, and so with the third. You will now have three sections left. The bees need not be brushed from them, but they should be combined with the six empty sections taken from the three new chambers, occupying the position of first, fifth, and ninth—that is, the two end sections, and the center one. Have your comb-guides and flannel covering on all the empty frames, or have at least three, in each chamber, supplied with pieces of empty comb, and guides on the others.

Place the last chamber formed in the old case, on the old stand. Give it all the bees from the swarming-box, and place on it the honey-boxes.

Place each of the other chambers in a separate case. Remove from their stands three of your most populous colonies to some distance—the farther the better—and set in their places the three new hives. The returning bees will soon fill them, and go to work to rear for themselves a queen, either by hatching out such queens as may be in embryo, or out of the uncovered larvæ or eggs in the comb. If there is neither in any of them, the thing will be a

failure, which should be noticed while performing the operation; but if performed at the proper time, either one or the other, or both, will be present.

The great trouble about this method is, that the bees will, while they are queenless, build only drone-comb; and at the end of ten or twelve days, it will be necessary to open all of them, and cut out all of the new comb, except a strip about one inch wide, across the top of each section. This comb should be carefully handled, and saved, to be placed in the honey-boxes, as it is as good as any for storing surplus honey.

If you have surplus queens in nuclei, or finished queen-cells, which you could give the new colonies, it would prevent the building of drone-comb.

## CHAPTER XI.

## NUCLEUS SWARMING.

"IN swarming bees on this system, we first rear a queen in a small cluster—nucleus—of bees, allowing the nucleus-hive to remain in its place until the queen becomes fertile, when we swarm the bees, by simply causing the two hives to exchange places. Unlike natural swarming, the old queen remains in the parent stock, and its labors go on scarcely interrupted."—KING—[*Bee-Keepers' Text Book*.

By means of the section bee-hive, this method of artificial swarming is easily performed. Take off the honey-boxes, and remove the brood-chamber, as before directed. Place the swarming-box in the case. Open the brood-chamber, and select a section containing uncapped worker-cells in abundance; also, a section containing some honey; but have no queen-cell in either. Brush the bees from each of them, to be certain you do not get the queen; or, if there are not too many bees on them, look them carefully over to see that she is not among them.

Put the two sections together, and add to them the two end sections, empty, with back and glass in; thus forming the nucleus-chamber of four sections. Put on side-strips, of the proper length, and fastened together. Stop the passage-holes in the top. Remove the swarming-box from the old case, and put the nucleus-chamber in its place, and let it remain on the old stand.

Insert two empty sections, with guides on, in the brood-chamber, in place of the two removed, with a full section between, and place it with the honey-boxes in a new case, about two feet to one side of the nucleus-hive. Insert plugs in the entrance-holes of the nucleus-hive, so as to fill them up, leaving room for only one or two bees to pass at a time. Enough bees will go into it to nurse the young brood, and will immediately commence constructing queen-cells, and rear a queen as soon, as certainly, and as well, as a whole swarm.

In ten days open the nucleus-chamber, and you will find that the bees have completed and capped over a number of royal-cells.

With a sharp, thin-bladed knife, cut out all of the queen-cells but one, and use them in forming other nuclei, by inserting each of them in a sheet of brood-comb, taken from an old stock, which, together with a sheet of comb containing honey, and seven empty sections, may be formed into a chamber, and placed in the case from which the combs were taken, as before directed. In cutting out the queen-cells, cut out with each about one inch square of comb surrounding it, and by cutting a hole of the same size, in the comb into which you intend to insert it, it may be put in, and the bees will fasten it properly. Be sure not to injure the queen-cell, by pressing with the fingers; nor to expose it to the hot sun, nor to the cool air, too long, or you may kill her; and when you insert it in the comb, leave an open space around and below the point of the cell, or the bees may so wax it to the comb around it, that she can not get out.

After cutting out the surplus queen-cells, open the parent hive again, and take from it another section containing brood, and add it to the nucleus; for by the time the young queen emerges from her cell, and goes out on her nuptial excursion, all the brood in the nucleus-hive will be hatched, and the bees having no brood to nurse, may swarm out with her, and you may lose the swarms; but by adding other brood, for them to nurse, you will prevent it, for they will not desert young brood. Now add sufficient sections, either empty, or containing comb, if you have it, to form the chamber of full length, letting the empty sections alternate with those containing brood and stores. Close it up and replace in the case.

Let it stand for ten or twelve days, by which time the new queen will have emerged from her cell, and become fertilized. Now, when the bees are flying out freely, take the brood-chamber containing the nucleus colony, and place it in the case of the parent hive, putting the brood-chamber of the parent stock in the case vacated by the new colony; in other words, let the two chambers, or the cases and all, if of the same color, or appearance, change places. The bees, returning, will soon fill up the new colony to the required strength. If, after three or four days, the nucleus-swarm seems to be weak, the parent stock may be removed to a new stand, some distance off, and the new colony set half-way between the two former stands; or it may be strengthened by young bees in honey-boxes, taken from the most populous hives, about sundown. These should be placed in an empty case, with the passage-holes over the

entrance-holes, until about sunrise next morning, by which time all of the old bees will have left them, and only the young bees remain, when they should be slightly smoked, and after puffing a little smoke into the brood-chamber, they may be placed on the new colony.

Each of the other nuclei formed by inserting the queen-cells taken from the first, should be treated, in every particular, like the first—that is, after the queens become fertilized, which will be in ten or twelve days; they should be shifted in the same manner.

When the system of “nucleus” swarming is adopted, or, in fact, any of the methods named, sufficient nuclei should be kept on hand to furnish queen-cells, or queens, to all queenless colonies, when made. This is important, if Mr. Quinby is correct, when he says that by the introduction of a fertile queen “the time gained in breeding is equivalent to a swarm;” and when we also remember that during the time a colony is queenless, the bees build only drone-comb, which, unless removed, will breed an unnecessary number of drones.

Never introduce queen-cells until they are completed and sealed over, for strange bees will be apt to destroy them.

Never give more than one queen-cell to a colony, for both coming out will create an unnecessary strife, which will prevent the fertilizing of the queen, until she has disposed of her rivals, and in the contest the surviving queen may be so disabled as to be useless.

If honey is not abundant when the swarming is done, it is best to furnish the bees required by means of the honey-boxes, after smoking them and the brood-chamber; for when honey is scarce, bees are more quarrelsome, and are more apt to get up a fight, and even sting the queen to death, when suddenly thrown into her dominions for the first time. For this reason, most writers recommend catching the queen and caging her, before introducing strange bees into her hive. While this is troublesome, and interferes with her laying, it is unnecessary when young bees can be had in the honey-boxes.

[See, under head of “*How to Catch the Queen*,” page 51, for other hints on this subject.]

## CHAPTER XII.

## HOW TO MAKE SWARMS BY "COLONIZING."

*First Method.*

HAVING a queen reared in a nucleus, or from any other source, have the tinner to make you a cage for her, seven-eighths of an inch deep, and one-and-a-half or two inches square. Have the sides of tin, and a bottom made of wire-cloth, not so fine but that a bee can put its proboscis through the meshes to feed the queen, or of wire not less than eight to the inch; leave the top open. Or make a cage yourself of a piece of wire-cloth, three by four inches square, formed into a tube, by rolling it around a round stick and tying it firmly with small wire (strings or thread are apt to be cut away by the bees), and putting a cork stopper in each end.

Take from a section-hive, a section containing brood, the older the better, but no queen-cell; also a section containing some honey. Brush all the bees off, leaving the naked comb. Place the queen on the honey-comb; place the cage over her, and press it into the comb until it touches the middle partition of the comb. The cage will stand out less than half an inch. The queen can move under this cover with ease, and the bees can not reach her to sting her. Fill out the chamber with empty sections, or with sections having in them any spare comb you may have, and close it up with side-strips, and glass in. Stop the bee-passages above. If you use the round cage, place the queen in it, and after completing the chamber, suspend her, through one of the upper passage-holes, between the two sheets of comb, end down.

Remove the brood-chamber and honey-boxes from a populous stock, to a new case some distance off, and put the colonizing chamber in its place. All the bees that are out foraging, and many that go out afterward, will return to the old stand and form the colony. There will be some confusion among them for a few days, when they will become reconciled and go to work, satisfied with the new order of things, as if nothing had happened. At the end of two days, if the confusion is over, the queen must be liberated. If in the square cage, and placed on the face of the comb next to the glass, the glass can be taken out and the cage removed;



if in the round cage, it can be drawn up through the passage-hole, the cork removed, and the queen permitted to escape through the passage-hole.

If you wish to make a very strong colony, give it also one-half, or all, of the honey-boxes, with the bees in them, which, in this instance, need not be smoked, as the bees are all of one scent.

The hive should be opened and examined, in about a week after the queen is liberated, and all queen-cells destroyed, as the bees may begin the construction of royal-cells while she is imprisoned; and unless they are removed, they may hatch out, and cause the bees to swarm out with the old queen. This is not, however, important, as such a thing does not often happen, and, even if it should, will not destroy the colony, but, if late in the season, may so weaken it, that it will not recover before winter, unless the swarm should be returned, or more bees added from the honey-boxes, or by taking full sections and bees from other hives, and strengthening them by inserting them.

#### *Second Method of "Colonizing."*

Select two or more sections, containing brood just hatching. Brush off the bees. Add enough empty sections, or sections containing empty comb, to fill out the chamber. Have a queen ready, and drop her in at one of the passage-holes, and close the entrances and passage-holes, so that she can not escape; for having no bees with her, she will try to get out at first. Add young bees from the honey-boxes. Take them off the hives about sun-down, and place them in a case, with the passage-holes over the entrance-holes, until about sun-rise next morning, by which time all of the old bees will have gone out, and only young bees be left, when the boxes should be placed on the new colony. This should be done the evening before the colony is made, so as to have them ready, and they should be slightly smoked before introducing them to the brood-chamber.

The object in this method, is to form the new colony entirely of young bees, as they will not quarrel with each other, nor sting the queen; and there is no necessity for using the cage.

The only danger in this method is, that robbers may take advantage of their defenseless condition. To prevent this, the entrances should be entirely closed, as before directed, for twenty-four

hours, and then only a part of one hole opened, so that only one or two bees can pass at a time, and a watch kept over them for a few days, until they get strong.

This method should not be attempted, except when the bees are collecting plenty of honey, as bees never rob when they can get honey honestly.

## CHAPTER XIII.

## HOW TO CATCH THE QUEEN.

SMOKE and take out the brood-chamber. Divide it, as directed under "*First Method of Dividing*," giving four sections to the end containing the entrance—five to the other end. Add a section with glass to the former; add a section with back and holes to the latter. Keep the passage-holes closed. Set each of the new chambers, so formed, in a new case, each occupying half the space occupied by the old case.

In a little while, the uneasiness shown by the colony having no queen will assure you where the queen is. Take out the chamber having the queen; divide it in the middle as before, closing up each part with the appropriate end-section. Put one back into the case from which it was taken—the other into another case by its side. You will soon again discover where the queen is. You now have either six or seven sections, without a queen, which may be set apart, after filling out the chamber, as a new colony, and just ready to receive a queen from a nucleus, or by introducing an Italian or Egyptian queen, you may make an Italian or Egyptian swarm; or, if they are left alone, they will rear for themselves a new queen.

If you want to catch the queen, open the two or three sections, in which she is, and she may be easily found in so small a compass; or you may proceed, as before, until you have her on a single comb.

The queen, with the two or three sections, may be set up, after filling out the chamber, as a new colony on the old stand, equalizing, as before directed, but so as to give her most of the bees.

The chamber may be divided into three parts at first, thus getting the queen out of six sections at one operation, which may be united as before.

This is a great advantage the section bee-hive has over any other, as we do not have to handle and examine more than one-third to one-ninth as many combs to find the queen, and the bees in the queenless parts are not much disturbed by the operation.

This is the safest plan to get comb and brood, with bees to form a nucleus, for the purpose of raising queens, and may be used instead of the mode pointed out under the head of "*Nucleus Swarming*," page 45. Two or three full sections of brood and honey are enough to give to the queen, to form her colony. Each of the others, having unsealed worker-brood, may be used to form a separate nucleus.

The sections having no queen, if set up in a new chamber, will proceed to rear queens—not one, but from six to twenty. In ten days they will be nearly ready to hatch. Take three other hives, and divide them into three parts each, as in the "*First Method of Dividing*," page 39, and ascertain which parts are queenless. Do this in the afternoon. Next morning give to each of the queenless parts a section containing a queen-cell, and fill out to a full chamber. In nine cases out of ten, this queen-cell will be received by the bees, and will soon hatch, and produce a strong colony, which may be further strengthened by transferring bees in the honey-boxes.

All of the different modifications of artificial swarming may be performed more readily with this as a basis, and with less annoyance to the bees, than when they are brushed and shaken about.

It renders Italianizing an easy thing. Having one hive Italianized, you can reduce the queen to one sheet of comb; and taking the other eight sheets, in ten days you can have eight Italian colonies. To the one sheet, on which is the Italian queen, add nine sections filled with comb, either empty, or from common stocks, with some empty cells, which she will soon fill with her eggs, and in ten days the operation may be repeated.

Give to the eight new Italian colonies empty comb, or partly filled comb, and a strong force of bees, and in three weeks the same operation may be performed with each of them.

Any section having in it more than one queen-cell, should be reduced to one, by cutting out the others, with about one inch square of comb. Take a center-frame, containing brood, from a hive of common bees, and cut a hole in it two inches in diameter. Dip the edges of the piece of comb containing the queen-cell, into melted wax, and insert it in the hole in the section, and adding two or three sections, containing black bees and brood—but having no other queen-cells in them—form them into a full-size chamber, with empty sections; thus Italianizing a hive with each queen-cell, with less trouble than on any other plan.

## CHAPTER XIV.

## LAYING WORKERS.

ALL modern authors agree, that when a colony of bees loses its queen, and there is no unhatched queen to supply her place, and there are no uncapped worker-cells, from which they can rear a queen, that there is frequently, if not always, found among the workers, one or more bees capable of laying eggs; but as the worker is physically incapable of being fertilized, that the eggs laid by them, hatch out and develop drone bees. It does not matter in what sort of cells the eggs are deposited, no worker or queen can be produced among her offspring consequently, when the bees die off, as they will in a few months, the stock becomes extinct.

Whether they are really workers whose productive organs are more developed than the others, or in fact queens, whose organs of generation are imperfectly developed, or that have not become fertilized, and on that account look like workers, is not important, while we know that the fact exists.

Heretofore, there has been no remedy suggested, by which the stock can be saved, as, while the laying worker is in the hive, no queen can be introduced, as the bees look upon her as their queen, and will destroy any other queen that may be given them. She can not be hunted out and caught, for she can not be distinguished from the common worker, so the stock has to perish.

The section bee-hive, renders it easy to remedy this evil. Proceed as directed, under the head of "*How to Catch the Queen*," page 51, until you have the false sovereign confined to one section. The other sections may be put together, adding an empty one, and after ten or twelve hours, a queen is introduced. Or, instead of the empty section, give them one having a queen-cell, or uncapped larvæ, from which they can rear a queen.

The section containing the worker queen, may be converted into an observing hive, when you will not be long in finding her, by observing closely through the glass.

*To Empty the Bees from a Hive, without Taking the Queen.*

It is often desirable to take from a very populous hive, a part of its bees, for the purpose of colonizing, or to add to weak new swarms, when they can not be had by any of the means pointed out in this book. If the queen is to be hunted up, in a dense population of bees, she is more difficult to find, and therefore, some plan by which a part, or most of the bees may be extracted, is very useful.

Have a tin tube made, about a foot long, and the size and shape of the entrance-holes—a little smaller, is better, so that it will fit in easily. Have one end open, the other closed, with two or three holes through it, large enough for a bee to pass through conveniently. Over each of the holes, have little valves hung, large enough to cover the holes, so light that they may be easily raised by a bee. Insert the open end into one entrance hole of the hive, from which you desire to take the bees. Stop up the other with a plug. Insert the other end into the same sized hole, in the swarming-box. Do this very early in the morning, or during the previous night, while all the bees are in. In the morning they will attempt to go out, as usual, and of course get trapped. The many uses to which such an arrangement can be applied, will readily suggest themselves to the intelligent bee-keeper.



## CHAPTER XV.

## PROFITS OF BEE-KEEPING.

WHEN honey-bees are properly managed, or even given the same attention that would be bestowed upon a cabbage-patch, or other cultivated crop, the profits derived from them will be large; and we venture to say, there is no part of the United States, where bee-keeping will not pay, if properly managed.

In the northern States, it is not so profitable as in the southern. Perhaps the greatest profit will be found to be between the two. Although excessive heat is not favorable, yet, extreme and long-continued cold is far more injurious. While from fifteen to twenty-five pounds of honey are required to winter a colony at the North, five to eight is sufficient at the South. While one or two good swarms, is as much as can be taken from a colony, and allow it to store away surplus honey at the North, from five to ten may be made from each one at the South.

The most favorable condition for bee-culture, is found in that section of the Union lying between the two extremes. Virginia, Kentucky, Tennessee, a part of Missouri, Arkansas and Texas, embrace the territory on which the maximum yield and profits may be obtained.

In the most unfavorable sections, bees properly managed will yield from one to two hundred per cent. on the capital invested; in the most favorable, from five hundred to one thousand per cent may be obtained.

A swarm of bees in a good hive, is worth \$8.00 or \$10.00. In the Northern States, it may be expected to yield, on an average, twenty-five pounds of honey, worth \$6.25, and certainly one new swarm of bees, worth \$5.00, which new swarm will yield fifteen pounds of honey, worth \$3.75. One other swarm may with certainty, be made from these two worth \$5.00—making \$20. Deduct ten per cent. for losses, in wintering and diseases incident to a cold climate, and you have about two hundred per cent. on the investment.

In the southern States, each swarm will yield, on an average, fifty pounds of honey, worth \$12.50. Three new swarms, from

the parent hive, and one from the first swarm made, and one from the other two, making five swarms, worth \$25.00; and thirty pounds of honey from the first new swarm, and fifteen pounds each from two of the other, making sixty pounds, worth \$15—making \$52.50. Deduct five per cent. for losses, and you have nearly six hundred per cent. on the investment.

In the most favorable sections named, each strong colony, in properly constructed hives, and properly managed, may be made to yield from \$75.00 to \$100.00.

These large profits are not to be expected by every one who engages in the business, for in this, as in most other occupations, it is only the well informed, diligent and industrious, who attain extraordinary success. The average will perhaps be found at about one half these figures, or less, which should satisfy any one, for where is there a business that will yield such returns!

Many persons will pronounce these figures too high, but as they are based upon the supposition that the business is conducted under the most favorable conditions—only such as may be attained by the proper study and attention to the business—I do not think they are far wrong. In proof of them, I submit the following facts:

William Buckisch, of Texas, says: "A vigorous colony, in an excellent hive, and enjoying favorable seasons, will yield as much as two hundred pounds (of honey) a year." "The intelligent, practical bee-keeper can take care of five hundred (colonies), and make part of the hives needed for new colonies." "From two hundred to five hundred colonies may be sustained on the square mile." "With sufficient assistance, the bee-master can keep one thousand hives, and even more.

Mr. Spangenberg, of Texas, had fourteen natural swarms from two old hives; six of them escaped to the woods; but five, out of the eight saved, yielded "a considerable surplus of honey."

The editor of the *American Bee Gazette*, October, 1866, says: "Last year there was stored by a certain stock of bees, that we can name, in less than eight weeks, one hundred pounds of surplus honey, besides forty or fifty pounds in the body of the hive.

A correspondent of the *Boston Congregationalist*, quoting from "*Bienenzeitung*" a German paper says: "Von Berlepsch has had stocks which brought in eleven pounds of honey in a day; Kaden, in Mentz, had days when one stock brought twenty-one pounds. Pastor Stein, in Mentz, had days when one stock brought twenty-eight pounds.

Richard Calvin, of Baltimore, says, in *Patent Office Report* for 1863: "There are very few, if any localities in the United States, habitable by man, in which bees, *properly managed*, will not pay a bountiful compensation for their cultivation, while in the more favorable localities, four or five hundred per cent. per annum, is no unusual product. In California, and in some of the southern States \* \* \* \* \* the product is often still greater. An average of fifty pounds surplus honey, per year, from each colony, under proper management, would, therefore, be a *very low* estimate." In a note he says: "In the middle and western States it is not uncommon, in some localities, for single colonies (in apiaries of one hundred or more) to produce one hundred pounds, and sometimes as high as two hundred pounds, of surplus honey, in a good season.

Bidwell Brothers, of Minnesota, report to the *American Agriculturist* the yield of their apiary for two years, 1864 and 1865. In 1864, they had one Italian and fifty-eight stocks of black bees. The Italian stock was increased to fifteen, and the fifty-eight stocks of black bees to one hundred and eighty-one, principally by artificial swarming; and averaged forty-two and one-half pounds box-honey per stock; while for 1865, from two hundred and four old stocks they received, on an average, a trifle over seventy-five pounds surplus honey per stock.

Mrs. E. S. Tupper, of Iowa, reports a stock of Italian bees that stored one hundred and fifty-six pounds surplus honey.

A. W. Ford, of Middleville, New York, from one hundred and thirty stocks, received six thousand pounds surplus honey in boxes, and one hundred and seventy new swarms.

Charles Baumel, of De Witt, Iowa, commenced with one stock, which swarmed twice. The first swarm stored ninety pounds box-honey, while the second swarm filled its hive, and stored thirty pounds.

Mr. Joel Curtis, of New Britain, Conn., says, in the *American Bee Gazette*: "My bees pay me for looking after often, and for good hives that cost from five to eight dollars apiece. From twenty-five pounds spare honey, I have increased to fifty, then seventy-five and one hundred, and now can obtain two hundred pounds and more from single swarms of bees, in one season."

Mr. E. T. Sturtevant, of Northern Ohio, with an apiary of over two hundred stocks, writes to the *Bee Gazette*: "My own bees, the last season, built combs, and stored honey in their surplus

boxes only from twelve to fifteen days—the shortest harvest I ever have known. In this short time, many of my swarms collected, in addition to an ample supply, for their own consumption, from thirty to thirty-five pounds surplus. The same would have been true had the number of stocks been ten times as great. I am satisfied it makes but little difference how many strong swarms are collected together; a few days will make them all rich.”

J. M. M., St. Charles, Ill., writes to the *American Bee Journal*, December, 1866: “I have taken from three swarms of bees, seventy-five pounds of honey each—worth \$22.50 each. From a stock of Italians, *three hundred pounds*, or \$90.00 worth, were taken; and seventy-five pounds *each* were taken from two stocks that *swarmed out* last spring for want of food. They were re-hived, and fed five pounds of honey each, leaving a balance of seventy pounds to each hive.”

Mr. J. L. Davis, of Delhi, Michigan, had an increase of ten natural swarms, from one stock of half-breed Italians, and thirty-seven and one-half pounds of surplus honey from the old stock, in 1866.

Mrs. Tupper, of Iowa, says: “I am sure that one thousand stands, where I live, will do well every season when one will, so long as I keep them all strong and in good order.” “In Russia the honey-producing plants are far inferior to ours, yet it is not uncommon to find apiaries of from one hundred to five thousand colonies.”

In Carniola, one of the states of Austria, there is an average of nine hundred hives kept to each Austrian square mile.

According to the Report of the Imperial Statistical Bureau of Austria, taking the whole country, which has an area of 11,240 Austrian square miles, and a population of 34,500,000, the amount of honey-surplus listed for taxation is 547,700 quintals, and 54,770 quintals of wax, valued at \$4,381,000.00. This only includes what actually goes into market, and it is estimated that what is consumed by the bee-keepers themselves, and what fraudulently evades taxation, amounts to at least \$10,169,000.00 more; so that Austria actually realizes from bee-culture \$15,000,000.00, or at the rate of \$1,334.00 to each square mile.—*See Patent Office Report* 1860, pages 281 and 282.

## CHAPTER XVI.

## THE OBSERVING BEE-HIVE.

WHAT we see with our own eyes makes a deeper impression upon us, than if it were told us by another. Many a reader of this book will see statements in it, which he will not believe; for there are many of the habits of the bee that are incredible to some persons. You have it in your power, by means of the section bee-hive, to attain personal knowledge of many of the strangest things told of the honey-bee; for you can at any time, in a few minutes, arrange one of the sections so that every movement of every bee is open to inspection at all times. It will well repay the trouble, by the instruction and satisfaction it will afford.

Take a single section, from the center of the brood-chamber, having in it a full-sized sheet of comb, with brood in different stages of development; some of which should be not yet capped over, and if there are some eggs just laid, all the better. One side of the section has its top and bottom-pieces projecting over about three-sixteenths of an inch. Have two strips of wood, one-half inch thick, and three-eighths of an inch wide, the length of the top and bottom-pieces, and after making holes with an awl, sprig them on the shoulders of the upright pieces, top and bottom, so that they will form like projections on the other side. Insert a pane of glass in each side, and you have the bees inclosed, and in it all that you want. Have ready a piece of plank, four inches wide, one inch thick, and twenty-two inches long. Bore a hole five-eighths of an inch in diameter, in the center of one end, eight inches deep. Bore another similar hole on the face of the plank, eight inches from the end, so as to meet the other hole and connect. Bore another hole, same size, in the bottom of the section, two inches from one end.

Now set the section on the plank so that the hole in its bottom will correspond with the hole on the face of the plank, and you have an entrance and exit-hole for the bees. Fasten the section firmly in that position, by screwing a small hinge to the plank, at each end of the section, and also to the section. Or, a frame, of



inch plank, may be made, into which the section will slip, the board just described, with entrance-hole in it, forming the bottom. It may be neatly made and varnished.

Stop the entrance-hole, by tacking over it a piece of wire-cloth or perforated tin, for two or three days, to prevent the escape of the bees, after which the hole may be opened, and they will not desert. It needs no cover, for the bees will work as well in broad daylight, as in a dark hive.

Set it on a table, at a window, with the entrance-hole outside, so that the bees will not enter the room in passing out and in. Protect it from the direct rays of the sun, by a curtain or shade.

Being without a queen, the first thing you will observe, will be that the bees will set about making one or more, by forming queen-cells, and placing in them some of the worker-eggs, or by converting some of the worker-cells, with larvæ in them, into royal-cells, and you will see the whole operation of making a queen—see her emerge from the cells; her departure from the hive to meet the drones; her return;—see her lay eggs for increasing the colony, and notice their development into bees.

You will see through the glass of your observing-hive, that there are three kinds of bees composing the population. The most numerous class consists of bees of a smaller size than the others, and are known by the name of *workers*. They are said, by those who have investigated the matter, to be females, with organs of generation imperfectly developed. They are (except in rare instances), exempt from the care and labor of reproducing the race. They are occupied constantly, however, and do all the work of the hive, as you may see by closely watching the hive. They are, continually, during the day, passing out and in. Notice one, as she comes through the entrance-hole. Each thigh has on it a pellet of pollen, or bee-bread. This pollen is what the immature bees are fed on, and is stored away for that purpose. The old bees seldom or never eat it. You see her coming in with as much of it, as she can carry. See what she does with it! She does not go up to where the honey is kept, but runs along over the comb, to the neighborhood of the breeding-cells, avoiding all the cells containing brood or honey. She finds an appropriate cell, and thrusting her hind legs into it, rubs them together, and thus brushes it off in the cell. She does not stop to arrange it, but starts off, leaving to others the labor of packing it away. She still has a part of her



load to dispose of. She goes next to the honey-cells, and into one of them pours from her honey-bag its contents.

Sometimes you will see a bee coming in with her legs well-filled with what you suppose to be pollen, but she passes by the cells where bee-bread is stored, and going over the face of the glass, makes her way to some hole or opening between the glass and wood, or in the joints of the hive, where she carefully takes it off, in small pieces, and plasters it over the opening, to exclude the air. This is what is called *propolis*, or bee-glue. It is collected from the exudations of resinous trees, such as the sweet gum, the pines, cedars, and firs, and from buds, which, when first opening, have a gummy substance over them, such as the poplar, the aspen, balm-of-Gilead, and most of the evergreens, and from many other sources. I have seen bees taking the grafting wax from the cloth with which grafts were wrapped, and, rolling it up into little balls, sticking it on their thighs. These three substances are all that bees are known to bring in, unless it be water.

Some contend that wax is also collected from the flowers, like bee-bread. But while you are observing your bees through the glass, you will, perhaps, conclude that there are a number of gluttonous, lazy bees, that are doing nothing, eating all the time, and laying idle on the face of the comb, clustering together, or slowly moving about in circles. They are making wax, and many of them at the same time are keeping warm and hatching the young brood.

The wax, of which all the honey-comb is made, is a secretion like the leaf-fat in a hog. In order to produce it, they eat great quantities of honey, and take but little exercise. Instead of its being formed inside the bees, as in the hog, it accumulates in little pockets, or pouches, under the rings of which the hinder-part, or abdomen, of the bee, is formed. You may not be able to see the little scales protruding from under the rings, unless the bee should get on the glass, with her feet towards you, as they are on the under side.

When the wax-scales are ripe, they are taken off by the bees, and being warmed by the heat of the hive and molded into the proper shape, they build of them the cells of the comb. The walls of the comb are just the thickness of the wax-scales, which are said to be so thin, that one hundred and eighty of them are required to make one inch in thickness.

Of this wax you will see them build three kinds of cells. The most numerous of which are about one-fifth of an inch in diameter; a few are one-quarter of an inch in diameter, but both built alike in shape. In the former the worker-bee is hatched and reared; in the latter the drone.

The third kind of cell is different in every respect from these two. When ready for the egg, it is in the shape of an acorn-cup, with the open end down, and when completed and capped over, resembles a pea-nut or gouber-pea-pod. It is nearly always built on the edge of the comb. The bees do an immense amount of work on these cells. Enough wax is used on one of them to build more than fifty worker and drone-cells.

In this cell the queen is reared. From the time it is commenced until it is completed, every bee in the hive seems to take an especial interest in it. One after another runs to it and examines it all over, inside and out, with the greatest curiosity. It seems to be their constant object of anxiety and devotion.

The worker and drone-cells are also used for storing honey—the queen-cells never. After the queen emerges from it, it is generally destroyed. When they want to rear a new queen they make a new one for her.

You will see also, that upon the worker-bee devolves all the labor necessary to hatch and rear the young brood. The queen takes no interest in her offspring nor do the drones.

On the bottom of your observing-hive, and in and around the entrance-hole, you will see another class of workers, that seem to be only “busy-bodies,” running up to every bee that seeks admittance to the hive, as if to inquire into their business. These are called guard-bees, and are placed as sentinels or pickets. They inspect every bee that comes. If it be a stranger they stop her, and if she refuses to turn back they drive her away by force. It is said that they let all pass that come, whether of their own hive or not, if they have their sacks filled with honey, or their legs full of pollen; but if a stranger, they require her honey as a bribe. After the guards have received the honey, which they eat, they permit her to pass.

The guard-bees not only keep off strange bees, but all insects, hostile or not; such as ants, earwigs, moth-millers, wasps, bumble-bees, hornets, worms, and bugs of every kind. They watch every

approaching danger, and if not strong enough to avert it, give the alarm to those within, who sally out and assist them.

It is they who fly at you, when they think you have evil intentions, and ordinarily they are the only ones that are cross. The bees engaged in other duties pay no attention to you, when you are about the hive, but go on with the work assigned them.

Some authors say, the guard-bees relieve each other from time to time—perhaps several times during the day—but a correspondent of the *Bee Gazette*, writing from Lexington, Ky., says: “In white-washing some old hives, some drops of the wash fell on a number of bees acting as guards, giving them a white coat. I observed them daily for about two weeks, traveling up and down before the hives, guarding the entrances; proving conclusively to my mind, that it was their sole occupation, at least for the time specified.”

On the bottom of your observing-hive, and in and near the entrance, in warm weather, you will see still another class of workers—a dozen or more—with heads lowered and bodies elevated, vibrating their wings rapidly, and making a continued buzzing sound. The more crowded and prosperous the hive, the more of this class you will see. They create, by the vibrating of their wings, a current of air, which passing into the hive, forces out the overheated and vitiated air, and supplies its place with that which is fresh and pure, while at the same time it regulates the temperature of the interior. Puff a little smoke through a hole in the top or side of the hive, and see how quickly others will join them, all through the hive, on one side of the comb turning their wings toward the entrance, on the other side, in the opposite direction, thus creating a current of air which will expel the smoke in puffs from the entrance-hole. Were it not for this arrangement, in hot weather, many colonies would be lost from suffocation, or the accumulated heat in the hive would melt down the whole comb structure, which would settle in a mass at the bottom of the hive.

The next kind of bees you will notice, will be a few, larger than the others. They look more like a horse-fly than a bee, and when they come out, make a loud, hoarse, buzzing sound, which would lead you to suppose them very dangerous fellows, but as they have no sting, their bluster will not terrify any one that knows them. These are the drones. They are a lazy set, that live on the best honey and do no work. They don't often even feed themselves, but require it of the workers, who feed them by means of their trunks.

During most of the time you will see them clinging quietly to the comb, and receiving their food from the workers. On fair, sunny days, between ten and three o'clock, you will see them all leave the hive, and with a loud, sonorous buzz, fly up high in the air. These are the male bees, or husbands to the queen. They have no object in existence, except to fertilize the queen, and while they are the fathers of all the brood, they are without a care or wish for their welfare.

They have but a short life, if it is one of ease and luxury. They are hatched in April, or May, and are subsisted by the bees until the swarming season is over, and there is no more use for them; then the workers expel them from the hive, and either maim them by mutilating their wings, so they can not get back, or kill them.

The third kind of bee you will see in the hive will be one, and one only, that is longer by one-half the body than the workers. She is of slender structure, her wings very short. You will easily recognize her by her dignified and matronly movements, and her nicely tapered abdomen, which is only two-thirds covered by her wings. Her abdomen is formed of six rings, while the workers and drones have only five. Her legs are longer than those of the workers, or drones. This is the mother-bee, or, as she is generally called, the "*queen*." She is rarely seen in an ordinary hive, and perhaps not one bee-keeper in a dozen has ever seen her, though they may have hived hundreds of swarms; but in the observing hive, she may be kept in view all the time. It is said she never leaves the hive but once—and that within the first twenty or thirty days after her birth, when she goes out to meet the drones, and become able to carry out the object of her existence—except when she goes out with a swarm to form a new colony.

Her only employment is to lay eggs, in the cells which I have described. If you will notice her, as she runs over the comb, you will see the bees disperse before her. Passing to an empty cell, she first examines it, to see that it is empty and ready, when she deposits in it a small, white, oblong egg, slightly curved, which is fastened to the wax by one end. Rapidly passing from cell to cell, she has been known to lay over three thousand in one day.

The eggs do not grow any, or undergo any change, for about three days. At the end of that time they hatch out a living grub, or worm, which you may see doubled up in the bottom of the cell.

You will now see a class of workers, called "*nursing-bees*," which, after hatching out the worms, do nothing but supply them with food. The bee-bread, that you have seen stored away so carefully, is now brought out, and prepared, by mixing with it water, and perhaps honey. The worms grow very rapidly, and attain their full size in about four days. The grubs now spin a very fine, soft silk, with which they form a cover for themselves within the cell. This covering is called a *cocoon*, and about thirty-six hours is consumed in spinning it. Up to this time they are called "*larvæ*." They now maintain quiet for about three days, at the end of which time they are entirely changed in form and appearance—from a worm they have been transformed so that they have all the parts of a perfect bee, but they are perfectly white, and very tender. They are now called "*pupæ*," or "*nymphs*." At the end of three weeks from the laying of the egg, the worker-cells are all bitten open at the ends by the inmates, and they emerge perfect bees. After five or six days, which is required to harden and strengthen their limbs, and during which time they are engaged in nursing the young brood, and doing other in-door labor, they issue from the hive, and join the older members of the community in the labors of the field.

The queen requires five days less to mature. Three days she remains in the egg. She is fed three days more. She labors one day spinning her cocoon. She remains quiet for two days and sixteen hours, when she enters the pupa state, in which she remains just four days and eight hours, making in all exactly sixteen days. The drones go through the same transformations, but require twenty-four days to mature and emerge from the cells. The periods here given are such as are required in warm weather. It requires longer in cold weather, unless the colony is very strong, and extreme hot weather may shorten the time.

By having a hole in the top or side of your observing hive, you may introduce the moth-miller, and see how the bees treat an enemy, or you may introduce a strange queen, and see how she is received, and try other experiments. You can take out a pane of glass, and catch the queen for exhibition, or to give to some new or queenless colony. If their queen is taken from them, all will be confusion, until the bees are satisfied that she is irrecoverably lost, when they will set about producing a new sovereign, as described in the first part of this chapter. While they are queenless, if there



are any new cells to be built, you will see that they will build only drone-cells, their instinct teaching them that a new queen would be worthless without male bees to fertilize her, and that the queen, when hatched, can lay drone-eggs to fill the cells, and thus provide herself with the means of producing workers and other queens. Many other experiments will suggest themselves.

The bees can not be wintered in the observing-hive; therefore, when honey is becoming scarce, the section may be taken out, and given—queen and all—to some colony that is queenless, or may be added to some weak swarm to strengthen them, or it may be used as a nucleus, which, by adding more sections of brood, and honey from other hives, and more bees, may be built up to be a strong colony. If let alone till late in the season, the whole colony will die out.



## CHAPTER XVII.

## HOW TO TAME AND HANDLE BEES.

A GREAT damage to progress in bee-culture has been inflicted by persons, at fairs and other gatherings, by their mountebank performances with bees. The impression is left with the spectator that the performer is possessed of certain "gifts," or powers of witchcraft, and that but few persons can have such perfectly fearless control of the little insects. Such is not the case. I will not deny that there are some few persons against whom the bees have an intuitive enmity, as that seems to be conceded by intelligent writers on the subject; but still I have my doubts. No person that I have yet seen, who has attempted to handle bees, as here laid down, and persisted in it with confidence of success, has failed. The whole art is based on the following facts:

*First.* A honey-bee, filled with honey, or other sweets, will not sting, nor make the attempt.

*Second.* A bee thoroughly frightened is subdued, and will not sting, whether fill with honey or not, but if honey, or other sweets, are convenient, will immediately fill itself.

*Third.* It is only the guard-bees about a hive that make war a profession. The other bees only assist them in emergencies.

Bees may be frightened thus:

*First.* By confining them to the hive, and slightly tapping, or jarring the hive. They will first attempt to get out, but finding no egress, they will run to their stores and gorge themselves with honey.

*Second.* By blowing smoke upon them. It matters not what substance is used to make the smoke, but the more pungent, the more decided the effect. Tobacco, cotton-rags, rotten wood and dried herbs, are generally used. Tobacco is considered the best as it has a more stupefying effect.

Any one can "charm" bees by first blowing a little smoke on the guard-bees, at the entrance, to cause them to retreat, then blow a profusion of smoke in at the entrance-holes and close them. In five minutes the smoke will have penetrated all parts of the hive,

and nearly every bee will have filled itself with honey, when the brood-chamber, and the honey-boxes, may be taken out, and any of them opened with impunity, and by the aid of a little more smoke, from time to time, any necessary operation performed.

Beginners, who lack confidence, may use a bee-hat, or full bees dress; or they may paralyze the bees with either puff-ball smoke, or chloroform. The following, from Mr. Quinby, gives all the directions necessary: "To operate with either, the hive should be closed on all sides. If puff-balls are used, dry it well, set on fire, and enclose it in a tube one and a half-inches in diameter—tin will make a good one—arrange so that the smoke may be blown into the hive, through a hole in the side near the bottom; a ball near two inches in diameter will suffice for one swarm. As soon as it is done burning, close the hole, and let the hive stand ten or fifteen minutes, when the bees will be apparently quite dead; and when they are in that state, any operation may be performed. They revive in thirty or forty minutes after the air is admitted, and must be confined to the hive, for two or three hours, till they recover their senses. When puff-balls can not be had, chloroform may be substituted—the effect is about the same. Saturate a damp sponge, about the size of a hen's egg; cover this with a tin, well perforated, funnel-shaped, or a wire-cloth of such shape as to prevent the bees, as they drop, from covering it too closely. Should the hive be too full, to admit of this under it, take an empty one, and turn it bottom up, which will give abundant room, and catch the bees as they drop off the stocks."

In using chloroform in the section-hive, have your sponge cut a little less than a half-inch thick, and two by three inches in size otherwise, with a string tied to it. Push this in at one entrance-hole, well back, and insert a plug behind it, to close the hole, and by looking through the glass you can see when the bees are all down. Or it may be dropped through one of the passage-holes, suspended by the string.

Puff-balls are the mushrooms that come up in old pasture land. After they dry up, they are filled with a light powder, which, when they are broken or tramped on, escapes like smoke.

Either of these can be used to advantage in transferring bees and comb to the section-hive, as they put the colony in a harmless stupor; they can all be enclosed in a box until the comb is transferred, when they may be divided, if necessary, and put in with their comb.

## CHAPTER XVIII.

## CARE AND TREATMENT OF BEES.

THE great secret of success in bee-keeping consists in "*knowing what to do, and doing it at the right time.*" Bees, to be profitable, require to be cared for, and assisted. By this I do not mean an officious intermeddling with them, in season and out of season. Such a course is highly injurious. They should be disturbed as little, and as seldom, as possible. Lifting the hives to ascertain their weight; opening the hives to inspect them, through mere curiosity; turning up the hives, or shifting them about, should all be interdicted in the apiary. Be certain of what needs to be done, and do it with as little delay as possible.

Every interference creates an excitement and frightens the bees, and they become disorganized for the time; they fill themselves from the honey already stored away, even biting open the covered cells to do it. And thus not only lose time, but destroy their former labor. It is asserted by some good authorities, that in the disorganization and confusion of these disturbances, the workers frequently kill their queen.

Avoid opening out the brood-chamber on cold mornings, or in chilly weather, lest the brood be injured. And avoid it also in the heat of the day, when honey is not abundant in the blossoms, lest robbers be induced to commit depredations.

Avoid standing in front of the entrances, in the middle of the day, when queens are being reared, lest you should cause one of them to fail to recognize her own hive, and enter another and be killed.

Some authors recommend passing, and repassing, frequently in front of, and about the hive, and to handle them often, to accustom them to your presence, and make them tame. I am satisfied that they are wrong, for I have always noticed that bees in a hive, in some seldom visited corner, were less easily irritated, than those in more frequented localities; and those colonies, that are the most seldom visited by their owners, generally accumulate the largest stores of honey. A honey-bee is not susceptible of learning any-

thing ; when it emerges from the cell it knows all that it will ever know ; and it is not in the power of man to educate them to know more, or to tame them, or to change their natural habits, or instincts, in the least. A wild bee, from a tree in the forest, is just as tame as one reared in an observing-hive in your parlor, and the latter will sting you just as soon as the former, if you do anything to irritate it, and would sting you just as soon as it would a stranger.

No art of man can cause honey-bees to change their natural habits, in the least. They are the same everywhere, and in all ages. They have but two objects in life—self preservation and the propagation of their species—these prompt them to store honey and propolis ; these prompt them to guard those stores, when laid up. The more imminent the danger, the more vigilant they are to guard against it. The oftener they are disturbed, the more fierce they are.

I know of one colony, set near a path, and by a gate, through which there was a continual passing, that was kept in such continual excitement, that it was dangerous for man or beast to go near them. They would attack horses in a lot forty or fifty yards off. Instead of only having a dozen or twenty guard-bees, they put out hundreds, and stationed them all over the hive. The consequence was, they seldom stored any surplus honey, and rarely swarmed.

Disturbances are less injurious during the working season, than in the winter ; for then every interruption arouses them from their semi-torpor, and causes them to consume more of their stores. They should be kept as quiet as possible during winter.

Avoid all rapid walking or running, about the hive, and all violent or quick movements of the arms or hands, or loud talking, or noises ; for all of these create excitement among the bees. When about the hives, let all of your movements be quiet and gentle ; do n't show fear ; handle them, when necessary, quietly and carefully, and they will seldom, if ever, sting you.

## CHAPTER XIX.

## ENEMIES OF BEES.

BEES have a number of enemies. First among them, and the most injurious, is the bee-moth. It is found everywhere. Wherever the bee goes, it follows. There have been many attempts to get up moth-proof hives, all of which are failures—most of them worse than failures, as they turn out to be only moth-nurseries. The idea of constructing a hive from which the moth would be excluded, is preposterous, as wherever a bee can go, a moth-miller will follow, and every trap added to a hive makes only an additional hiding-place for the moth.

I consider the section bee-hive as near moth-proof as can be made. The bottom-board of the case being covered with salt excludes them from there, and that is their favorite resort. They will not go in at the entrance-holes so readily as into other hives, as they are deep and crooked. The miller must see his way clear, before he will venture to enter a hive. A dozen would dodge in at a hole through an inch-wall of a hive, where one will find admission through a hole three or four inches deep, with a short turn in it, as is the case with the section-hive. All frame, or other hives, with movable bottom-boards, or set on standing boards, furnish the miller with all the advantages they need, for depositing their eggs in the filth which accumulates in the cracks between the hive and bottom-board. There is no chance for them to get to any place suitable for depositing their eggs, in this hive, except they first pass through the entrance-holes, which they seldom do.

The golden rule, in bee-keeping, is embraced in four words, "*Keep your colonies strong.*" Live up to this, and you need not fear the bee-moth. A strong colony will take care of themselves, and ask no assistance in defending themselves against their worst enemy. Feeble swarms, and reduced colonies, are at the mercy of the moth. The section-hive offers every facility for keeping them strong, and a very little care will insure you against loss from this source. [See "*Directions for Strengthening Weak Colonies*," in another part of this book.



If the moth should get into the hive, it is easily discovered, and if the bees are not strong enough, you should open the sections and cut them out, and then strengthen them.

Ants are sometimes found in and about bee-hives, and are said to consume the honey, but I have never been able to discover any damage done by them. The salt, however, excludes them from the section-hive.

Of birds, the bee-martin, or king-bird, is the only one that catches the bees. I have had it suggested to me that they only catch drones. If so, it should be known, as very trifling harm would result, but, perhaps, a positive benefit. They should be shot until such is proved to be the case. Woodpeckers sometimes annoy the bees in winter, by hammering on the hives, and disturbing their rest, and it is said will sometimes pick up such bees as appear at the entrance-holes. Such as are seen about the apiary in winter, should be shot.

Mice sometimes get into hives, in winter, and commit injury. The entrance-holes should be partially closed in winter, so as to exclude them.

Toads and snakes catch many bees that fall to the ground, and even snatch them from the entrance-hole, when too near the ground.

Hornets are said to destroy many bees, but I have never seen them attempt it. I think they live on smaller insects.

Spiders destroy many bees by catching them in their webs.

Sometimes the bees themselves do great damage in an apiary, by robbing each other. In the North, this frequently occurs, in the spring and fall, when honey is scarce; and at the South, in their hot, dry summers, when they have scanty food. I have never known it to take place in this latitude (Kentucky). The following are said to be the causes generally inducing them to become robbers:

1. Leaving honey scattered about near the hives, or placing comb, dishes, and other vessels, having honey sticking to them, near them, to be licked up by them.
2. Letting hives become too weak to defend themselves, or permitting them to remain queenless.
3. Too many and too large holes in the hives.

Various remedies have been proposed, and most of them proved successful:

1. Make a great smoke for hours in front of the hive attacked.



2. Rub turpentine about the entrance of the robbed hive, or saturate cotton with turpentine, and stick it about the fly-hole.

3. Place an onion, in pieces, or garlic, in the hive of the robbers, to give them a strong scent, so that the guard-bees will detect them, when they try to enter the attacked hive.

4. Contract the entrance, so that two bees can not pass at once.

5. Remove the hive of the robbers, a mile or two off—the further the better.

6. Throw any litter, such as small chips, shavings, or pieces of rags, into the hive of the robbers. They will set to work to clear them out, and forget to rob other hives.

To find the home of the robbers, throw some flour on them as they are leaving with their booty, and notice what hive they enter.

It is far easier to prevent the evil than to remedy it. *Keep your colonies strong*, and there is little danger.



## ADAIR'S SECTION BEE-HIVE.

### TERMS.

AS THE OLD PLAN of selling rights for using bee-hives is very inconvenient, and operates very unequally on the small and large bee-keeper, we have adopted another and fairer plan. As soon as it can be done, I will have the hives placed on sale, at convenient points to supply all. The hives sold will each bear my metal "trade mark," secured to me by law, and any persons, making or using any hive embracing any part of my invention, and not having this trade mark on it, will be subject to damages and fine under the patent law.

Until arrangements can be made to supply hives to all, I will sell these trade marks to those wishing to make their own hives or have them made, at 50 cts. each, for any number less than 10; \$5 per dozen; \$10 for 25, \$18 for 50; and \$35 for 100. They will be sent by mail post-paid. To Ministers of the Gospel, I will sell for their own use 20 for \$5; any additional number at 35 cents each. Honey-boxes in same proportion. Hives bearing these trade marks can be used by any one into whose hands they may fall.

Sample hives, with trade marks attached, furnished on board steamboats at \$4 each.

## ADAIR'S SECTION HONEY BOXES.

THESE boxes have been considered by all who have seen them, and the honey made in them, a great improvement on all others; and the honey sells for enough more than any other honey to pay ten times the amount necessary to be paid for the right to use them. Whatever may be the fancy of the bee-keeper as to the construction of the main hive, or brood-chambers, all want the honey-boxes. They can be used on any hive and made of any required size. On some of the patent hives it may be necessary to put on new honey-boards with passage-holes to suit those of the honey-boxes, but on most of them it is only necessary to stop the old holes and make new ones in the right place. One great fault in all the improved hives is that their capacity for surplus honey receptacles is too limited. This can be remedied by making the caps or coverings for the honey-boxes deeper. They are generally 6 or 7 inches deep, allowing but one tier of boxes to be placed on at a time. They should be at least 13 inches deep. This can be done by making an additional cap 6 or 7 inches deep, the size of the old one, without top or bottom and placing it on the hive under the other one.

Set on the hive what boxes it will hold, and when the bees get fairly to work in them, lift them up and put another set under them, and the bees will immediately go to work, and fill all nearly as soon as they would have have filled the single set.

Those who have hives and are satisfied with them and only want the honey-boxes, will be furnished with "Trade Mark" for honey-boxes alone, by mail, at 40 cts. for each hive on which they are used; \$4 per dozen hives; \$8 for 30; \$12 for 50; \$22 for 100. When this mark is attached to the hive, any number of boxes may be used on it, from year to year, and new ones substituted when they are taken off.

A sample box, with trade mark for two hives will be sent by Express for \$1.

A sample box, with material, cut ready for nailing together, for 500 sections, which will set up 62 boxes of eight sections each, with strips and backs (no glass), which can be nailed together by almost any one, and will hold about 750lb of honey, will be shipped securely packed, for \$6, or less than one cent per pound. Material for 1000 sections, etc., sent for \$11. This does not include the trade marks.

A new pattern of queen-cages, sent by mail at 20 cts. each, or 6 for \$1. Every bee-keeper needs at least 6.

Agents with a capital of \$20 to \$50 wanted in every county in the United States. Exclusive territory given.

Orders for hives except samples, should be addressed to Messrs. Moors & McAdams, Hawesville, Ky.

For trade marks, sample hives, honey-boxes, and agencies, address:

**D. L. ADAIR,**  
**Hawesville, Ky.**

















































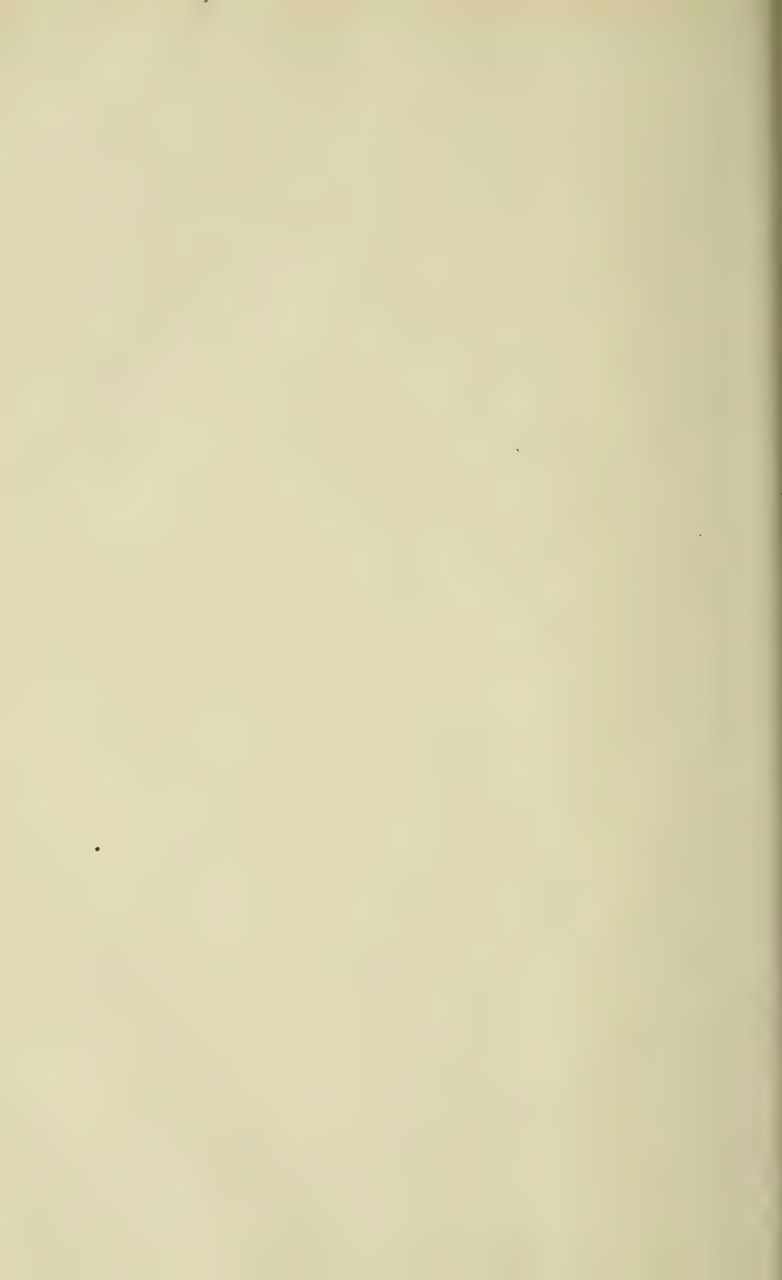






























































LIBRARY OF CONGRESS



0 002 828 088 9

